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Canada's fertile northland. Evidence of Mr. R.E. Young, D.L.S. Supt. of Railway Lands before the select Standing committee of Agriculture and colonization, 1907-8..Ottawa, C.H. Parmelee, Printer , 1909.

THE NORTHLAND

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MR. R. E. YOUNG, D.L.S.

SUPERINTENDENT OF RAILWAY LANDS

BEFORE THE

SELECT STANDING COMMITTEE

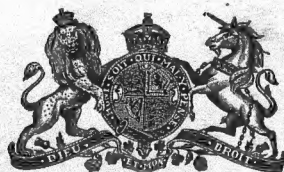
ON

AGRICULTURE AND COLONIZATION

1907-8

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CONTENTS.

CANADA'S FERTILE NORTHLAND, pp. 143-190.

| | Page. |
|--|----------|
| Railway facilities. | 143, 154 |
| Population. | 144 |
| Area of wheat under cultivation. | 144 |
| Area of land available for settlement. | 146 |
| Climatic conditions. | 147 |
| Statistics with regard to Siberia. | 148 |
| Sources of wealth in the north country. | 151 |
| Enormous quantities of fish. | 152 |
| Acreage of good agricultural land. | 155 |
| <i>Timber:</i> | |
| The timber belt of the North. | 157 |
| Barren lands. | 157 |
| Northwest Territories—North of Manitoba. | 158 |
| Province of Saskatchewan. | 167 |
| Province of Alberta. | 171 |
| Peace River Country. | 174 |
| Lake Athabaska. | 178 |
| Slave Lake. | 179 |
| Great Slave Lake. | 180 |
| Mackenzie River. | 182 |
| Mackenzie Basin. | 183 |
| General remarks | 184 |
| Great Bear Lake. | 186 |
| Rivers of Arctic Basin. | 188 |

CANADA'S FERTILE NORTHLAND.

HOUSE OF COMMONS,

COMMITTEE ROOM No. 34,

WEDNESDAY, March 11, 1908.

The Select Standing Committee on Agriculture and Colonization met here this day at 11 o'clock, a.m., Mr. McKenzie, Chairman, presiding.

The CHAIRMAN.—We have with us to-day Mr. R. E. Young, D.L.S., Superintendent of Railway Lands of the Department of the Interior, who will speak on 'Canada's Fertile Lands North of the Saskatchewan River.'

MR. YOUNG.—Mr. Chairman and Gentlemen: I think I should at the outset say that I have evidence at considerable length for every statement that I intend to make here. I would first explain the large map of the Dominion depending from the wall on my right on which I have coloured in red the townships that were surveyed on the 1st of January of this year, the townships of which plans have been published. The settlement is, of course, confined to the areas coloured in red. You will notice a small patch of darker red colour around the city of Winnipeg. That is the land that was surveyed according to a departmental map issued in the year 1873. I have the map here and I think it is interesting if you would look at it because immediately outside the limits of the surveyed townships the land is shown topographically in a very incorrect manner. According to that map the information about the country outside the surveyed area was very limited indeed. There are about 4,500,000 acres of land in that small tract that was surveyed in 1873.

The subject of my story to-day is the portion of the Northwest north of the coloured area. I would like you to look at the map on the other side of the room. That is what is known as the Homestead map published by the Department of the Interior. I want to devote a few minutes, if you would allow me, to an explanation of the progress in the coloured portion as shown on the large map. There are three reasons why I want to do that. I think that when I bring before you in the manner which I shall endeavour to do, the facts that I have in my possession to-day, the growth in that settled portion will appear surprising and interesting; and the growth that we may expect in the settled portion in the future will show that it is of great importance that we should know and investigate more about the country north of the coloured portion. If that region is as good as I think it is, investigation is very necessary, and if it is as bad as some people imagine, it is equally desirable that we should ascertain all that we can about it. There is another reason why I want to explain a little about this coloured portion on the map, and that is I think I can show you in a very brief way and with very few figures that the area of land available in the surveyed portion of the Northwest is much more limited than many people imagine. There is a third reason, and perhaps you will allow me to state it, and that is I was a resident of the Northwest for nearly twenty years and I lived there through all the dark years when we hoped that many things would happen which have since come to pass. I like to dilate upon the progress that has taken place and to tell you a little about what we expect will happen in the future. It is a little difficult to explain these things by figures without becoming wearisome, and I am going to illustrate some of my points by diagram.

First let me point out the railways on the Homestead map. There are nearly 7,000 miles of railway on that map. I think the exact figures were 6,400 odd on the

8 EDWARD VII., A. 1908

1st June last year, and, therefore, it will be safe to say there are 7,000 miles of railway now. When I landed in the Northwest on 1st May, 1880, there were not any miles of railway in the Northwest except a half finished line between Emerson and St. Boniface. We had to cross the Red river into Winnipeg on the ferry. The line was built by laying ties on the prairie and spiking the rails to them, and that is all the railway there was.

The population in the settled portion of these three provinces can be safely stated, I think, at 1,000,000 people. I have made a little effort to get the figures worked out, and I think that is a fair estimate and not very much outside of the mark. The Census Bureau has given me an estimate of 6,800,000 as the total population of Canada on the 1st January last, so that we have in the three provinces, excluding British Columbia, one-seventh of the population of the Dominion at this date.

Now, I want to illustrate by means of diagrams some of the figures to which I will draw your attention. There are 120,000,000 acres on the coloured portion of the map to my right, and I have converted that into a square on the same scale. I do not know that I could show it in any better way. Here is a square on the same scale representing the coloured area on the map (holding up square). The area of land alienated is 86,000,000 acres, which is represented by the somewhat smaller square and which I place in front of the larger square. The balance around the edge is what we have left in the surveyed portion of the Northwest. I am giving you round figures, although I have the figures exactly. Now, let us compare the area alienated with the area under cultivation of 8,500,000 acres represented by this much smaller square. The area under wheat is 5,000,000 acres represented on the same scale by this smaller square.

This smaller square represents, as I say, 5,000,000 acres of land, but it also represented 100,000,000 bushels of wheat in 1906. The figures of the Department of Agriculture are 110 odd millions. Those of the Winnipeg Grain Exchange are 92,000,000 or 93,000,000, so that I think I am safe in saying there were about 100,000,000 bushels of wheat raised in the Northwest in 1906. Supposing I take the 86,000,000 acres of land and cut off a quarter for the purpose of making a calculation which may seem to be a rather optimistic one. If I scale the 86,000,000 acres down in that way to 65,000,000 acres and divide the 5,000,000 acres into it it will go 13 times. Is it not a fair supposition that we can multiply 100,000,000 by 13 and get 1,300,000,000 bushels of wheat within a reasonable number of years? If you feel inclined to doubt that supposition, gentleman, there is just one point I ask you to remember; that is selected land. It is not land taken at random over an unexplored country; it is selected land. Over 31,000,000 acres of that land was selected by about 200,000 homesteaders. About the same amount was selected by seven or eight railways to satisfy their land subsidies, selected by expert land examiners, and while I would not pretend to be an authority on this subject and to make the statement that there will be raised annually $1\frac{1}{2}$ billions of bushels of wheat, for the purpose of my argument I want to just ask you to turn that amount into dollars and consider it for a moment. We are not taking into account oats, barley, flax or rye or the cattle products of that country at all. Take that area of land with the wheat which can be grown to a lesser extent even than my figures would give, and it seems a reasonable and safe statement to make that in the time of people now living there will be the equivalent in money of 1,300,000,000 bushels of wheat. Remember, there are over 50,000,000 acres of land that have not gone into that calculation. There are 120,000,000 acres of land surveyed, and I am only asking you to consider this as applied to 65,000,000 acres.

There is another aspect of this question that I would like to bring to your notice. I have a telegram here from a gentleman in Saskatoon, and he followed that message up by a letter. I got these figures because I knew the gentleman, and I particularly asked him to give me figures that I could absolutely rely upon and quote. I only get figures from that point, although similar results can be shown from many other points

APPENDIX No. 2

in the West. I have no interest in Saskatoon in any way; I do not own an acre of land there or anywhere else in the Northwest, and do not expect to. Now, this gentleman's statement, which I consider very striking, is: '375 acres wheat, net cash yield per acre \$14½.' He wrote me at greater length afterwards. Well, gentlemen, I think it is quite a striking thing to reflect upon. That man goes into that country and farms 375 acres. He spends \$6 or \$7 in raising wheat on it, and after the crop has been harvested he has over \$14 per acre to put into the bank.

By Mr. Jackson (Selkirk):

Q. What year was that? A. Last year. He has given me a number of other figures. Some of them are a great deal more. There is one of \$18, but this is a clean cut statement and that is the reason I took it.

By Mr. Wilson (Lennox):

Q. Was that for 1907? A. That is what I understand from his letter.

By Mr. Thompson:

Q. Are the 86,000,000 acres as yet unclaimed?—A. No, that is the land alienated from the Crown.

Q. There are about 120,000,000 acres in all? A. Yes, of surveyed land.

Now, about the north country. The first thing I would like to speak about in that connection is this: In considering the north country a great many people have the idea that latitude governs the climate. Of course, that is absolutely untrue. It is ridiculously untrue, particularly as compared with our country, it does not apply at all. I will go into the climate question in a few minutes, but in the meantime let me draw your attention to the fact that that northern region is practically all a wooded country. The knowledge we have of that country has been obtained by people who have travelled along the rivers in canoes almost entirely. I would like to ask any gentleman to try and imagine how much valuable knowledge would have been obtained of the great and wealthy province of Ontario by means of travelling along the St. Lawrence, the Ottawa and other rivers as men used to travel in canoes 200 years ago? And yet that is the kind of knowledge that we have about that north country almost entirely. Let me ask you to notice a small red star on the map, 14 miles outside the Arctic circle. That is Fort Good Hope on the Mackenzie river. The statement was made before the Senate Committee last Spring, which was investigating the north country, that potatoes, cabbages and onions were grown at Fort Good Hope.

A gentleman who gave evidence before the Senate Committee last spring was in my office about a week or ten days ago. He told me that he was at Fort Good Hope last summer and he said: 'I saw just as good vegetables growing there as I have seen in the province of Ontario.' The gentleman in question is Mr. Conroy, of the Indian Department. Now, the growth of vegetation is rapid, beyond belief to us, in that north country. I will quote you a statement made by Bishop Clut, who, I think, was stationed at Fort Providence for many years, and who gave evidence before the Senate Committee, which was presided over by the late Senator Schultz, in 1888. He said, speaking of vegetation at Fort Good Hope: 'I have observed this phenomenon: Towards 7th or 8th June vegetation commences and in five or six days the leaves of the trees had reached their natural size.'

Now, I am going to tell you what the red spots on this map mean. Those are points where wheat has been grown. They were not selected for any agricultural purpose because they are points where the fur trade has been carried on by the Hudson Bay Company. That is why they are selected. Another point I would like to mention to you is that the inhabitants of that country, and there are very few of them, are almost exclusively flesh eaters. They do not eat, and they do not desire to eat,

8 EDWARD VII., A. 1908

wheat or such products. I want to show you—no doubt many of you have seen it before, but it seems to me important—a sample of Ladoga wheat that was grown at Fort Simpson. Here it is (holding up sample). I got it from Dr. Saunders, Director of Experimental Farms. Fort Simpson is the farthest north of these red points just short of latitude 62 or just about it. I showed that wheat to a gentleman who is accounted an authority on the subject, and I don't think you could get a better authority; I am referring to Senator Finlay Young. I said 'Mr. Young, would you please look at that wheat, but do not refer to the label on the bottle, and tell me what you think of it?' Mr. Young examined the sample in the way that men who are experts on wheat often do. I think he saw nearly every grain of it; he took good care to do so. He said 'It is very nice wheat, I would call it good wheat. It has been slightly frosted but I think that wheat would go about 64 pounds to the bushel.' Well the label on the sample says 'Ladoga wheat, grown at Fort Simpson on the Mackenzie River, 62 pounds to the bushel.'

By Mr. Schaffner :

Q. How many days was it growing?—A. I could not tell you. I have seen the statement that wheat is grown in 86 days, that is in some points in the Northwest country, but I am not sure about that. Now, gentlemen, here is a sample of wheat from Fort Vermilion (displaying sample). I showed that also to Mr. Young and got his opinion on it. In both instances he expressed his opinion before he knew where either of the samples came from. He said 'That is pretty nice wheat. It is not so nice a wheat as the other but I think it would make first rate flour; it is good wheat.' Now, consider for a moment that the area enclosed by these red spots would be larger—I think considerably larger—than the entire Province of Ontario. I will just take a moment to enumerate these points. There is Fort Simpson on the Mackenzie river, Fort Providence—and a witness said before the Senate Committee last spring that he had seen wheat ready to cut at Fort Providence on the 28th July, 1906, and it was cut a few days later, and good crops of oats and barley at Fort Liard. You see in the report of the Senate Committee of 1888 that Ex-Judge McLeod gave evidence and quoted from his father's journal. His father was an official of the Hudson Bay Company and his journals extend from 1811 to 1849. He said: 'Wheat is a sure crop at Fort Liard four times out of five' Then there is Fort Chipewyan. Wheat that was grown there took the highest award I think at the Centennial Exhibition in 1876. Then there is Fort Vermilion where a flour mill is turning out 35 barrels a day. That mill is electrically lighted and equipped in a modern manner. There were 25,000 bushels of wheat grown at Fort Vermilion in 1906. This farthest point west on the Peace river is Fort Dunvegan. (There are two or three other points Hudson's Hope, and Fort St. John, which I have omitted on account of their being down in the valley.) Proceeding with reference to the wheat points there are Lesser Slave Lake, Fort McMurray, and Ile a la Crosse. At the latter point Professor Macoun found them growing wheat and grinding it with a horse power mill in 1875. Then there is Stanley Mission, 150 miles north of Prince Albert on the Churchill river, Archdeacon McKay gave evidence before the Senate Committee that wheat had been grown for seven years in succession at Stanley Mission. At Cumberland House, Sir John Richardson records that wheat was grown in 1820 when he passed through there. We also have the statements of witnesses before the Senate Committee that wheat has been grown at Norway House, Cross Lake and Nelson House.

There have been a great many statements made about the probable area available in that country for settlement. One gentleman, a member of the Alberta Legislature, Mr. Bredin, said that there was 100,000,000 acres of land—he was particularly referring to the area as far east as the Athabaska and west and north of it—available

APPENDIX No. 2

for settlement. Mr. Conroy of the Indian Department, who has travelled over that country a great deal, made the statement that there was as much land in that tract of country as was now settled west of Winnipeg. There is a great deal of evidence existing as to the probable area of land available in that country. The Minister of the Interior had an exploration made, I think it was in 1905, of the country between Pas Mission on the Saskatchewan and Fort Churchill. That party was sent out for the purpose of exploring the country. They were members of the Geological Survey of Canada and their statement—which I presume can be absolutely relied upon—amounts to this: That there are 10,000 square miles of good clay land between the Pas and Fort Churchill—6,000,000, odd acres of land. A surveyor of the Indian Department who had been around Lac la Ronge, told me that he considered the land surrounding its shores just as good as any land south of the Saskatchewan. There has been a great deal of other evidence given about that part of the country, which I will not take time to dwell upon this morning. I think it may be generally stated that south of the Churchill river, west of the Athabaska and Slave rivers and extending as far north as Fort Simpson, and perhaps a little farther, there is a good deal of good land all the way.

Now, as to the climate. Mr. R. F. Stupart, the Director of the Meteorological Service of Canada, has devoted a good deal of attention to this subject, and he says that he would consider the mean summer temperature of $57\frac{1}{2}$ degrees was a safe limit up to which you could grow wheat. He said that he would not dogmatize on the subject, but that that would be a safe limit. I think that Dr. Saunders would put it at a little lower. I have endeavoured to put on that line as near as I could get to it. I admit the information is not complete, but we have done the best we could from the evidence supplied by Mr. Stupart. I will trace a line on the map running from the northeast corner of the province of Manitoba—just outside the spots that I have mentioned—crossing the Mackenzie river about half way between Fort Wrigley and Fort Norman, and then following the eastern slope of the Rockies southerly. During his evidence before the Senate Committee last spring, Mr. Stupart furnished a table giving the summer temperature, and I think it is a very striking thing that the summer temperature of Fort Simpson, Fort Chipewyan and Winnipeg are nearly the same—that is, from the 1st June to the 20th August or thereabouts—the summer temperature would therefore be nearly the same as that of the city of Ottawa. It is hard to understand or believe that a man may be going about here in summer clothing and that if he could be transported to Fort Simpson in those months that he could wear the same clothing without discomfort. You may say that it is pretty cold in the winter. I do not think there is any doubt about it. It is somewhat colder than the North-west.

By Mr. Schaffner:

Q. Do you say that Ottawa is colder?—A. I do not think that Ottawa is colder than the North-west.

Q. I think it is this winter. In my opinion, there is no doubt about it?—A. However, as to that there is just one remark that was made by a witness before the Senate committee last spring that seems to me to be very pithy and to the point. He said: 'Things don't grow in the winter.'

Mr. JACKSON (Selkirk).—They do in British Columbia.

Mr. YOUNG.—If the agricultural possibilities are in that country, the fact that it is a cold climate won't deter people from settling there. I have read a few unfavourable expression of opinion about that country, but I never heard of any one saying that it was not a healthy country. I gave you the figures a few moments ago of the net result of growing wheat in the vicinity of Saskatoon. I believe that it would be a

8 EDWARD VII., A. 1208

reasonably safe statement to make that better wheat can be grown the further north you go. Many authorities agree that the further north you go, almost to the northern limit of the wheat-growing area, the better the wheat that is grown. I believe that the statement has been made that wheat has been grown at Fort Chipewyan weighing 68 lbs. to the bushel. Men have gone into the most undesirable places on the earth's surface in search of gold and to carry on gold mining. They have gone into the hottest and the coldest and the most unhealthy countries for this purpose. Surely there is no amount of gold mining equal to the results obtained at Saskatoon, viz., 14½ dollars net per acre!

I want to meet the point that would arise in a man's mind about the cold winter. I want to introduce to your notice at this stage something that I have prepared for this committee this morning. I will fasten it to the map so that you can see it in its relation to the subject. This is a map of the province of Tobolsk in Siberia. It is drawn to the same scale as map and placed in the same position as to latitude. That small dark spot, not quite one-third north of the south part of the province, is the city of Tobolsk. That city has a population of 20,427 people. The city of Onsk on the Great Siberian Railway, just on the south boundary and about 100 miles north of the latitude of Edmonton, has a population of 37,470. The city of Tomsk, which is not within the province of Tobolsk, but in an adjoining province and in a little lower latitude than Tobolsk, has a population of 52,005. The population of the province of Tobolsk was a million and a half of people in 1900.

By Mr. Duncan Ross:

Q. How far up does the line of habitation extend? A. I have a more complete map, but I am sorry I did not bring it over. I might say though that two-thirds of the way up we find a road marked on the map which would indicate settlement I suppose. I also have figures here of the population of some eight or ten town in the province of Tobolsk. There is one of 1,000, another of 3,000, another of 7,000, one of 8,000, and so on. The farthest north is the town of Bere-zoff with a population of 1,073 and in latitude 63.50.

By Mr. Jackson (Elgin):

Q. What information have you as to the number of convicts that were sent in to that country? A. I don't know as to that. Whether they were convicts or not in 1900 they raised 6,480,000 bushels of wheat, 3,000,000 odd bushels of rye, 972,000 bushels of barley and 10,617,000 bushels of oats. These figures are contained in the Encyclopedia Britannica.

By Mr. Armstrong:

Q. Can you give us any idea in what part of that province these crops were chiefly raised in; was it in the southern portion? A. It certainly would be. I don't think there is any question but that it would be in the most southerly portion. All the information I have would go to show that settlement would not extend to the most northerly regions. Still the fact that there were towns of 1,000 people in the northern portion would go to show that there must be something being done there that would support a town of that size. I have tried to work out some parallel between the climatic conditions there and our own country, but I am not able to give it to you exactly. I think that the figures given by the Russian government would probably be the most favourable that they could furnish. The mean temperature for the period from September 1 to June 1, which would include the winter months—I think that is all it is necessary to discuss—would for the province of Tobolsk be practically the same temperature as at Fort Simpson. It is a very striking thing that a million

APPENDIX No. 2

and a half of people live in that province and that they raised 6,480,000 bushels of wheat in 1900. Surely if our country is as good as we think it is, we ought to people it to as great and even a greater extent, and to complete the parallel between the two I think I can say without any hesitation that we must have something which they have not got, and that is the benefit of British institutions.

By Mr. McIntyre (Strathcona):

Q. The southern boundary of Tobolsk is 100 miles north of Edmonton? A. I think it would be. It would be just about 10 miles north of Athabaska Landing.

When I was discussing the wheat question in connection with these points that are coloured red on this map I drew attention to the fact that they were not selected for wheat raising. I want to discuss that point a little further. I say there are three reasons why we can expect better results in wheat raising in our northern country than has been accomplished up to the present time. I will quote what Professor Macoun has stated in a pamphlet relating to the Yukon (reads):

'When grain ripens in the country and is again sown there, it will take on the conditions of its environment and mature earlier, and early frosts like those attributed to Manitoba, will have no effect as the crop will mature before they come. I may remark here that the wheat in the Northwest ripens earlier now than it did twenty years ago, and many people believe that it is the climate that has changed, whereas it is only the wheat that has adapted itself to its environment.'

I think that any gentleman who has been following the trend of affairs in the Northwest will agree with me that the conditions are better with respect to possible injury by summer frosts now than they were twenty years ago. I don't think that can be questioned. That is one reason that is given. Now, I asked a gentleman who is better able to express an opinion on the point than I am a few days ago what he thought of that statement of Professor Macoun's. He said: 'I don't altogether agree with that statement. I do not hesitate at all in saying that the improvement is marked, but I will account for it in another way. If you raise wheat on virgin soil on the prairie it will grow to perhaps about the height of a man's shoulder the first year. The next year it will not be quite so high. The third year it will be perhaps not so high as the second year, but it will mature earlier. Devote that land to some other use for a year or two and then go back to the cultivation of wheat again, and you will get the wheat growing to the height of about the second or third year, but it will mature earlier. The soil is sharpened.' He explained to me that in the Red River valley, where the land is heavier, it would take very many years to bring about that result, and it would not be of so much value to this generation, but in the lighter soil, farther west, it has a marked effect, and, as he argued, there is no question about it.

By Mr. Wright (Renfrew):

Q. Will you permit me to give you some information on this point? A. If you would kindly allow me I would ask you to first let me finish the point with which I was dealing. The third reason why we can expect better results in that north country is because the staff at the Experimental Farm have been steadily carrying on experiments with a view to obtaining a variety of wheat that will ripen a few days earlier, and if they can shorten the term for the ripening of wheat by four or five days or a week, it will bring into the certain line as to wheat growing an enormous area of land. There is no question about it. They have accomplished some good things already and they expect to accomplish a great deal more.

By Mr. Blain:

Q. What was the quality of the 6,480,000 bushels of wheat produced in Siberia? —A. I could not tell you that. There are a great many other statistics about Siberia

8 EDWARD VII., A. 1908

that are interesting. For instance they exported 40,000 lbs. of honey from an adjoining province in Siberia in 1900 and so on: I have not the time to enlarge upon it.

There is no question about it that in the north country there are grasses of the greatest possible value to cattle raising, finer grasses than there are in other parts of the northwest. I could read from a letter written by Professor Macoun on that point. I do not like to pass Professor Macoun's name without saying that I believe that if there is a man whose name will be handed down to posterity in Canada with honour it is that of Professor John Macoun, because of the optimism he has always had with regard to that country from the first, (hear, hear.)

I want to draw your attention, or relate to you, a little incident that happened to me in the Spring of 1882. I was down at Warren's Landing, at the foot of Lake Winnipeg, about the 1st June, 1882. It was an isolated place, to some extent, and rather difficult to get at, and our arrival in June on the first steamer, was the first intimation they had there of a great many things which had been happening about the boom at Winnipeg. I was talking with a gentleman there who was connected with the fur trade and had been in it nearly all his life. He was a man of intelligence and was able to talk intelligently about any subject which you might mention, and he was perfectly sane except on one point. I will tell you what he said to me. I was telling him about all the things that were happening at Winnipeg and among others the fact that the Canadian Pacific Railway had built enormous shops. He then said, 'It doesn't make any difference, Mr. Young. They will be allowed to fall to pieces. That country is no good; it is only good for the fur trade. I have lived nearly all my life in this country and we old-timers know much better about the country than anyone else.' 'But,' I said, 'They are spending millions of dollars in building a line across the prairie.' He said, 'I don't care, you will find they will take up the tracks.' That man was able to talk sensibly about anything else, but there you see was the influence of the fur trade, the influence of the conditions that he was surrounded by; and you will find that time after time when gentlemen in that northern country who have been connected with the fur trade are asked about the country their inclination is always to detract from its value. We hear a lot about the 'Last West,' our Great West, and its value for settlement. I suppose it is the last West and I suppose that it is the last not only for the fur trade of the Hudson Bay Company, but also for other people who are interested in that trade.

By Mr. Barr :

Q. Their interest is to keep the country for the fur trade?—A. They are not enthusiastic about encouraging settlement.

By Mr. Jackson (Selkirk) :

Q. That gentleman might have been acquainted only with the country east of Warren's Landing?—A. He was not giving me any information regarding the North country that I am talking about, but of the prairie country that was not then settled.

Q. His opinion was influenced by the country that he had been in for so many years?—A. That might be. There is another point that I want to bring to your attention as to the conditions in the North-west country. About three weeks ago I wrote to Professor Macoun and gave him a list of questions about that country to which I asked him to give me answers. I think it is a very remarkable thing that in his reply he says: 'In my report to Mr. Alexander Mackenzie in 1877, just when I was fresh in the Northwest, I gave details about certain districts of the northland which I could not give in a letter, but I would suggest that extracts from this report may be taken and placed upon file with this letter, as my statements and conclusions as printed 30 years ago still remain without impeachment at the present time.' I think it is a

APPENDIX No. 2

remarkable thing that with respect to the country through which Professor Macoun went in 1872 and 1873, and which excited his enthusiasm—this is the country that I am trying to tell you about—he now says of it: 'My statements remain without impeachment at the present time.' Now, he speaks in this letter of two facts that I think are very striking. He says: 'In conclusion, I may say that the climate of the whole northland is a stable one, and as local conditions change it will improve, and where small spots are now called good land whole areas will take that term. The low altitude and the long day are fixed conditions and will always be the same. The forest will be cleared and the muskegs drained, and as the land becomes drier the frosty conditions will pass away and a good country will result.'

Now, there are some other sources of wealth in that country. I am going to place this pointer on the pencil lead line that I have drawn on the map extending from about the middle of Reindeer Island in Lake Winnipeg northwesterly and crossing the Peace River about 50 miles north of Peace River Landing. That is the line shown on a departmental publication issued a year or so ago, the mineral map of Canada as the northerly limit of prospecting. North of that line there is practically no prospecting as the note on the map says. The mineral wealth of that country is very great. There is no question about it but that there are a great variety of minerals. The first thing I want to touch on is petroleum. That has been frequently spoken of as the petroleum field of the world, and I will give you one point about that. Mr. McConnell made an examination of that field some years ago for the Geological Survey and he made a calculation of the amount of crude petroleum which it would have taken to have saturated the ground to the extent that he had discovered. He says that the amount of crude petroleum sufficient to saturate the area that he had examined would be $6\frac{1}{2}$ cubic miles. A witness before the Senate Committee in 1888, whom I quoted a few minutes ago, ex-Judge McLeod said that there was an area of 100,000 square miles in that country within which there were found indications of petroleum. There is a tar spring down at Great Slave Lake, there are some I think on the Mackenzie, and there are 75 miles, or thereabouts, along the Athabaska where these tar springs are found, caused by the oozing out of petroleum through centuries of time. I have a photograph here that I can show you of a bank of the Athabaska river, somewhere near Fort McMurray, and I think from the height of the man standing on the bank that it would be about 200 feet high. It has been represented to me as being solid tar or asphaltum. At any rate the soil is saturated with petroleum to the whole depth of the bank.

By Mr. Blain:

Q. Have you visited the country yourself?

A. I have not been in hardly any of the country which I have been describing. I have been studying a good deal, and I do not think I have got nearly to the end of my studies yet. There are about one hundred authorities in my office that I have not yet gone through.

Now as to natural gas. It is a matter well known to many people that there is natural gas in that country. There was a well sunk twelve years ago on the Athabaska and it has been burning ever since. It is spoken of as the largest gas well in the world. You will find that a great many travellers who have gone through that country lit natural gas along the banks of the river and used it for camp purposes. A gentleman who was there boring for oil told me that he had used natural gas constantly as it was escaping through cracks or openings in the soil.

Then there is salt. Let me quote again from the evidence given before the Senate Committee: 'Near Fort Smith there is a salt mine which is probably the most beautiful and the most abundant in the universe. There is here a veritable mountain

8 EDWARD VII., A. 1908

of salt. By digging a little in the earth, from 6 inches to a foot, rock salt can be found there.'

Gold has also been discovered there, also copper. There is no question but that copper exists at some points in the Barren Lands. Bishop Clut in his evidence before the Senate Committee spoke of Indians coming into Fort Providence and having crosses made of copper. I do not think that any white man has found out exactly where that copper came from. At any rate there is lots of copper.

There is also coal. In 1789 when Sir Alexander Mackenzie went down the Mackenzie river, he found that there was coal in the banks which was burning, and this extended for many miles along the river. That coal is burning yet.

Iron also exists in many parts of that country. Mr. Tyrrell, I think it is, described the country north of Lake Athabaska as being most promising from a mineral point of view. I cannot enlarge upon the subject of minerals just now, but I merely mention the fact of their existence. I want to ask your attention for a minute or two upon a point about the mineral question in that country which has impressed me, but I do not know whether I can convey that impression to you or not. I want you to consider Dawson City which is marked with a small red star on the map. I have here a clipping from the *Manitoba Free Press* of 20 years ago in which it says that miners had just discovered gold in the northwestern part of Canada up near Alaska. That was the first intimation that any gold was to be found there. I have the figures of the Geological Survey showing that over \$120,000,000 of gold were taken out from the Klondike fields up to 1st January last, and it is well known that that amount is far within the mark. As a matter of fact the output is a great deal more than that. So much for Dawson City.

Take Rossland, B.C. I lived in that city for two years and I am somewhat familiar with the conditions. The townsite of Rossland was ungranted land of the Crown in the year 1894. The Le Roi mine is just on the edge of the townsite and the total product of gold, silver and copper at Rossland up to the same date as I have given for Dawson was over \$40,000,000.

Now just for a moment let me refer to Fernie, B.C. The coal deposits at Fernie were unknown 25 or 30 years ago. I got some figures from Dr. Haanel about the coal at Fernie and from the figures which he gave me I make this calculation: There were 1,800,000 tons of coal mined either in the year 1906 or 1907—I am not quite sure which—in that field. Taking that as a basis it will take 12,222 years to exhaust the coal at Fernie at that annual production per year.

Another point farther east, not far from our own Ottawa Valley, is Sudbury, the discovery of the copper and nickel mines of Sudbury was coincident with the construction of the Canadian Pacific Railway, and the discovery of Cobalt, still nearer Ottawa, is a matter of about five or six years. Now I think that when you reflect upon the fact that these discoveries have been made in a prospected portion of Canada, and consider that probably more than one-third of the total area of the Dominion has not been prospected at all and that these discoveries have all been within the last 20 years, you will admit that it opens up great possibilities. We have the evidence from the staff of the Geological Survey as to the discoveries of the past and there is every reason to expect that there will be equally great mineral discoveries in the Northwest in the future.

The timber resources of the country I have not got time to dilate upon.

I just want to mention the water powers. There are beyond question water powers of enormous value in that country and with the development of electricity it is hard to set a limit on the value which those water powers may have.

I am going to mention one more subject, and that is the fish wealth of the north. If there was no other source of wealth in that country I think it would be of tremendous importance to the people of Canada to be made aware of the value of the

APPENDIX No. 2

fisheries of that country. There are in every lake, river and stream, enormous quantities of fish; whitefish, lake trout and jackfish in the clear waters and sturgeon in many rivers; salmon in the rivers running into Hudson Bay and the Arctic Ocean, and the salmon known as the Inconnu in the Mackenzie river and in Great Slave lake.

I have tried to compile figures that would impress upon you the value of the fisheries, but I do not know whether I have accomplished anything or not. With such meagre information as I had I tried to make an estimate of the water area in that country. Every lake, river and stream probably is full of fish. West of the Nelson river and north of the settled area, I estimate there are 63,000 square miles of water. There is a great deal more than that, because there are many smaller lakes that we have not got any information at all about. That is very nearly the same area as there is in Lakes Superior, Erie and Huron combined. There are two lakes, Great Slave lake and Great Bear lake each of which is larger than Lake Erie, considerably larger.

The natural system of waterways in that country attracts one's notice. I have not got the figures exactly at hand, but I think it is in the neighbourhood of 1,300 miles from Fort Smith to the mouth of the Mackenzie in which steamers drawing 6 feet can navigate at any time of the year when the river is open. Fourteen miles above Fort Smith you get into another system of waterways going up the Slave and up the Peace rivers, with falls not far from Vermilion. Above those falls you can go for 650 miles up the Peace river to the Rocky Mountains, all navigable. Then there is the Athabaska river, or a considerable portion of it. So we have very much over 2,000 miles of navigable waterways in that country.

Now, gentlemen, there is a deduction that seems to follow from all these statements if they amount to anything at all. That deduction is, that it is time that we knew more about the country. I think it is time more knowledge was acquired, and I am going to ask you to consider for a few moments a condition somewhat similar to that which we have here in another part of Canada—I refer to New Ontario. Previous to about the year 1899, I think, it would be the opinion of anybody who knows anything of Ontario that the region north of the Canadian Pacific Railway line was of no value whatever for any purpose practically speaking. I had always heard it so spoken of myself, but without dwelling upon it, let me say that it was a country which did not promise to be ever of any great value. Some six or eight years ago an exploration of that country was undertaken. I believe that for departmental purposes New Ontario was considered to be the country lying north of the main line of the Canadian Pacific Railway. The country was divided into ten districts and there were surveyors appointed who took charge of each district for exploration purposes. Attached to each party was a land examiner, a geologist, and a timber expert. Well I have been told—I went to some trouble to find out—that the cost of that exploration was \$74,000. When the reports of these exploring parties were made up the government were able to announce that there were 16,000,000 acres of clay lands in New Ontario suitable for settlement. There were nearly 300,000,000 cords of pulp wood discovered in New Ontario, and I have the statement within the last few days of the Deputy Commissioner of Lands and Forests—I asked him the question and he said that the building of the Temiskaming and Northern Railway was a result of that exploration. The discovery of Cobalt was in consequence of the construction of that railway, and I believe the fact of there being 16,000,000 acres of clay land in New Ontario, which will be traversed from end to end by the Grand Trunk Pacific Railway, was an assurance to the people of Canada that there would be local traffic on the line and it would, therefore, be a much more certain enterprise than it otherwise would have been.

By Mr. Jackson (Selkirk):

Q. Whereabouts on the map are those 16,000,000 acres?

8 EDWARD VII., A. 1908

A. The line of the Grand Trunk Pacific, as you see it on the map, runs pretty nearly through the middle of it. I have not got the exact boundary. There have been 1,800,000 acres of land surveyed since that exploration took place as a result of it, and the deputy commissioner in Toronto in writing to me made a very remarkable statement. He said that in some of the townships it had been found that there was not one single acre of land which was not suitable for settlement and he added 'I think that is a record unique in any country.'

Now I am just about through, gentlemen, and I hope I am not wearying you. I would like you to look at the homestead map. I told you at the outset that there were practically 7,000 miles of railway.

By Mr. Duncan Ross:

Q. Of constructed railway?

A. There were 6,400 odd miles of railway constructed up to the 1st June last.

Q. In operation?

A. In operation. Those figures were obtained from the Department of Railways and Canals. The actual number at that time was 6,422, and I think it is safe to say that there are now 7,000 miles. That excludes every section that is not in actual operation. Now the line that is coloured green on that map is the Canadian Northern, the red line is the Canadian Pacific Railway system, and the brown line is the Grand Trunk Pacific. You will find three small lines at the lower part of the map in another colour not far west of Winnipeg, which represent the Hill lines which have just entered into that country. I think there is no question that Mr. J. J. Hill would not undertake to enter that country to such an extent if he did not intend to remain there. Therefore, it is almost certain that the Hill system will spread over that country as well as the three other systems referred to. Now if you consider the railway situation there and bear in mind the facts which I gave a few minutes ago as to the result of exploration in New Ontario, have we not the right to expect if we can demonstrate beyond question by actual exploration that the North country is what I take it to be that those railway systems will extend into it and occupy and possess it in the railway sense of the term? The Canadian Northern is at the Pas on the Saskatchewan, at Prince Albert, at Battleford and at Edmonton. The Canadian Pacific Railway is at Edmonton. Surely the Grand Trunk Pacific and Mr Hill's system would not stop short of it if there was any traffic to be got. I think it is easily capable of demonstration that before long we shall see railway construction in that country which will open it up and lead to further discoveries.

I remember when we used to hear in the West, it was an expression used derivatively about us from across the line and was used very frequently, that the Canadian Pacific Railway was 'The Dominion on wheels,' and it was often said that Canada consisted only of a fringe of settlement along the northern boundary of the United States. Well, gentlemen, when we consider that Fort Simpson is 900 miles north of the International boundary and that wheat has been successfully grown there under unfavourable conditions, I think that we are in a position to show that the Dominion has broadened considerably from what it was 20 years ago.

By Mr. Armstrong:

Q. Before you sit down will you give us a little information about the timber lands in the North country? You mentioned the fact that there was a great extent of timber lands. Could you give us a short description of it?

A. If the committee will allow me to take up the timber question in about a week's time I will give them a great deal of information on the subject. There are about 100 authorities in respect to that country, the statements of men who have travelled through it and written about it. I have got one of my staff looking through

APPENDIX No. 2

those authorities and getting everything that has been said not only about timber, but about fish. As to the fish the results of the investigations so far have been personally amazing to me. I could quote to you the statement of Mr. J. B. Tyrrell who said that 140,000 white fish were caught at Fort Providence in ten days' fishing. There were 32,000 caught in two nights' catch on the Beaver river north of Battleford. There is a statement made by Professor Macoun as having been found in the journals of Sir John Ross, I think it was, that six tons of salmon were caught at one haul in the bay in the Arctic ocean into which the Back river empties. It is the same story throughout. Every traveller who has ever mentioned the subject speaks of every lake and stream as being full of fish.

By Mr. Duncan Ross:

Q. These are mere fish stories?

A. You can find it in the evidence taken before the Schultz Committee in 1888. There is where the statement was made.

By Mr. Armstrong:

Q. Tell us one timber story?

A. I won't undertake to discuss the timber question to-day because I am not quite prepared.

By Mr. Duncan Ross:

Q. If you are going to discuss the question of timber, the attention of the authorities should be drawn to the fact that a lot of timber is being destroyed by fire each year. That is a question which this committee could very properly discuss in connection with the matter of timber?

A. That is a point that I particularly want to develop in the investigation which I am conducting as to the amount of timber which has been destroyed by fire. There is a tract of country between Lake Winnipeg and Hudson bay, on the Burntwood river, on which there is some extremely fine timber. But it appears that the Indians have burned that country over through some superstitious reason of their own for generations back, and they have practically destroyed all the timber. But at one time it was a well timbered country, and I believe there is a great wealth of timber in that north country. At present, however, I am not prepared to discuss the subject.

MR. THOMPSON.—Last year from the Yukon, in about latitude 63, I got some wheat which I submitted to this committee, and also laid on the table of the House. This year I have some oats grown at the same point which I would be glad if the committee would examine. (Sample produced and laid upon the table.)

MR. YOUNG.—I am not going to say anything about the Yukon. I have some information here that would be interesting to the committee, but it is such a large subject that I have confined myself to the statements already given.

By Mr. Duncan Ross:

Q. There is one question which has not been brought out sufficiently, and that is in connection with the quantity of land under cultivation. You said, if I remember right, that there were only 8,500,000 acres of land already under cultivation?

A. I gave you the round figures and they were about 8,600,000 acres.

Q. That is in the Northwest, taking in Manitoba, Alberta, Saskatchewan and the unorganized territory, and you say there are 86,000,000 acres of lands alienated?

A. Yes, in the surveyed portion. There are practically no lands alienated outside the surveyed area.

Q. What proportion of that 86,000,000 acres of land alienated would you say was equal to 8,500,000 acres brought under cultivation; I mean as to the character of the land?

A. What I said was this: Of the 86,000,000 acres of land I cut off one-quarter and brought it down to 65,000,000, and then I drew attention to the fact—

Q. Then the 65,000,000 acres you consider good agricultural land?

A. I think you can measure agricultural results with safety on 65,000,000 acres. Then I pointed out that 31,000,000 acres of that land had been selected by homesteaders, that it is selected land.

Q. Do you say that there are 8,600,000 acres under wheat?

A. No, under grain.

Q. But 31,000,000 acres of land have been taken up by homesteaders?

A. Yes, in round figures.

Q. Now we are getting near the point.

A. And about the same amount has been granted to railways. That is why I tried to figure out that we were going to have in the future from the land now surveyed a yield of 1½ billion bushels of wheat or its equivalent.

By Mr. Thompson:

Q. What is the total area of tillable land?

A. In the north country north of the settled part of the Northwest? We had the evidence of two witnesses before the Senate Committee last spring. One said there were 100,000,000 acres of land available in the district from the Athabaska river west. Another gentleman said that there was as much land available for settlement in that country as was now settled west of Winnipeg. I don't think that I would like to say there are 100,000,000 acres.

Q. Mr. Bredin said that before the Senate Committee.

A. Yes. I would not like to adopt that as my own statement; I think it is a pretty liberal estimate.

By Mr. Herron:

Q. Do you think the land north of the Saskatchewan river, speaking of the two provinces, is of equal value for all purposes as the land south of it or to anywhere near the same degree?

A. I don't think it would be in the case of Saskatchewan.

Q. Well as to Alberta what would you say?

A. I think perhaps the best part of Alberta is in the north.

Q. I mean including mineral and agricultural possibilities?

A. There are great mineral possibilities in the northern part of Saskatchewan, but the Churchill river would probably be the limit of agricultural land. There is no question that up as far as the Churchill river the land is good. That you can expect just as good results in regard to that land most of the witnesses seem to agree. When you go north of the Churchill the land is not good. It is a rocky country and sandy. The mineral possibilities are greater with respect to anything else but petroleum in the northern part of Saskatchewan, I think than they are perhaps in the northern part of Alberta. But that is not based upon accurate discoveries, that is the information which has been given.

By Mr. Thompson:

Q. What is the distance of Fort Providence, Fort Simpson and Fort Liard from the boundary line?

A. Fort Simpson is 900 miles and 575 miles north of Edmonton.

APPENDIX No. 2

By Mr. Duncan Ross:

Q. You have avoided the Peace River country; why did you not say something about it?

A. It was included in the country that I was talking about. I enlarged my remarks so as to cover a much larger area than the Peace River country. I did not want to forget Saskatchewan.

By Mr. Thompson:

Q. You say that Fort Good Hope is fourteen miles below the Arctic circle?

A. Yes.

Q. They raise vegetables there?

A. Yes.

Q. Have they tried to raise wheat?

A. I don't think so, but they raise good vegetables—cabbages and lettuce for instance.

By Mr. Duncan Ross:

Q. Are you aware of the fact that in the Peace River country last year they had no summer frosts and better grain than at any other place in the Dominion and that this winter has been a marvellously mild one? I might say for the information of the committee that I had a letter from a gentleman who was surveying in that country all last summer. He left there some time at the first of the year and when he reached Winnipeg he was amazed at the cold weather. The gentleman in question said it had been bright sunny weather all the winter in the Peace River country?

A. The statement about that country is borne out by dozens of witnesses. That can be established by a reference to the evidence taken by the Schultz Committee in 1888 and our more recent report of last year. Witness after witness has made the same statement. One gentleman said that he had driven for three weeks in that country in January without an overcoat.

THE TIMBER BELT OF THE NORTH.

The following report of the timber of the most northern central belt of Canada embraces a wide area, extending east to west from the Hudson bay to the Rocky mountains, a distance of nearly one thousand miles, and from the Hudson, Nelson, Saskatchewan and Athabaska rivers on the south to the Arctic ocean on the north, a distance of eleven hundred miles.

BARREN LANDS.

By consulting the accompanying map it will be seen that a line drawn from Fort Churchill on the Hudson bay in a northwest direction to the mouth of the Mackenzie river divides, roughly, the so-called 'barren lands' from the timber belt. This, however, does not mean that trees do not grow north of this line. They are found in isolated spots along the banks of streams sometimes far within the barren lands. A fringe of fair-sized trees, for instance, is found along the banks of the Hanbury river although there are no trees to the north or south of it. It will be noticed that the forest extends about 750 miles farther north on the Mackenzie river on the western side of this tract than along the Hudson Bay on the eastern side. The reason of this is because of the remarkable mildness of the western side in comparison with the eastern. The 55° isotherm for summer extends as far south of the Hudson bay as the Lake of the Woods. About half way between the 49° and 50° north latitude. It trends northwest from here, crossing the Mackenzie river where the latter crosses

8 EDWARD VII., A. 1908

the 130° west longitude. The total distance from its extreme southern limit to its northern limit is about twelve hundred miles. Of course the isotherms for the winter months do not indicate such a difference in the winter climate.

No effort has been spared to exhaust every available source of information and it is therefore hoped that the seeker after knowledge as to the timber resources of this portion of Canada, will find herein a compilation as complete as it is possible to make it. The information is derived from the most reliable authorities from the time of Samuel Hearne, 1772, to Elihu Stewart, 1906. The old explorers and travellers including Samuel Hearne, Sir Alexander MacKenzie, Sir John Franklin, Sir George Back, Sir John Richardson, and many others were consulted as well as the men of our own times, including Professor John Macoun, Dr. Dawson, Dr. Bell, R. G. McConnell, J.B., and J. W. Tyrrell, all connected with the Geological Survey of Canada, Otto J. Klotz, D.T.S., W. Thibaudeau, C.E., W. Ogilvie, D.L.S., D. C. O'Keefe, D.L.S., T. Fawcett, D.T.S., and others.

The thought which comes to the mind again and again and which remains as the lasting impression from the study of the recorded impressions of all these explorers and travellers is the unanimity of testimony to the enormous loss by fires to the timber wealth of the north land of Canada. Serious, calamitous and almost irreparable as the loss from this source has been and continues to be in all parts of Canada, it is surely far greater in the north. A few reasons for this are:—

(1) The forest growth is slower towards the north till in the extreme north a tree over four hundred years old had only attained a diameter of from 2 to 3 inches, according to one observer.

(2) The northern forests occupy to a considerable extent land not likely to be required for agriculture and therefore the more desirable to be retained as a supply for future needs of the settled portions of the country.

(3) These forests should comprise for all time to come, if kept reasonably free from fires, one of the finest and most extensive game preserves in the world.

(4) Great possibilities of mineral wealth exist in many portions of the north country, but the destruction of the forest wealth of the country might easily be the deciding factor in rendering impossible of economic development vast deposits of minerals which would otherwise contribute to the general prosperity of the country.

Another conclusion one reaches, in studying the timber question in the north land of Canada, is the limited area, comparatively speaking, as to which there is any information. By a reference to the accompanying map on which it has been attempted to show, by colouring, some of the information collected in this report and as far as possible all the routes of travel followed by the different explorers, this will appear more plainly. The explorers travelled, as a rule, along the rivers or lakes in canoes, and in many cases their knowledge was only such as could be gained in that way.

Many explorations have been made, it is true, away from the rivers, but the fact remains that there are thousands of square miles as to which there is absolutely no information.

This report is divided for convenience into districts comprising generally those formed by the river basins, commencing on the east with the Hayes, Nelson and Churchill, across the continent to the Rocky mountains and then north to the Arctic Ocean, forming roughly the letter 'L.'

NORTHWEST TERRITORIES—NORTH OF MANITOBA.

In this portion of the Northwest Territories which is soon to be added to Manitoba, the timber would be all good if it were not for the repeated burnings, which have reduced the average diameter of the trees found there to a foot or less. Most of the timber is young and if protected for some years will average a much larger diameter, as is proved by the size of a few trees that have escaped the fires altogether. Other-

APPENDIX No. 2

wise the size and quality of the timber is governed by the climate, the best timber being found as you go south.

SASKATCHEWAN.

The greater part of northern Saskatchewan is poorly timbered, the best timber being found in the south and southwest of the district mentioned, where the timber is good and in comparatively small areas, excellent. Unlike the country north of Manitoba, the size of the timber is governed by the soil and not by latitude. J. B. Tyrrell found better timber on the Cochrane river, away in the north, than in the country south of that to the Churchill river; a country rocky and with poor soil.

ALBERTA.

Alberta is more thickly wooded, but the timber, especially in the muskeggy parts, grows rank and small. Forest fires are to some extent accountable for this as the soil is excellent and the latitude could not affect it as the farther north you go the better the timber gets. Good timber is found on the numerous islands and alluvial flats along the lower Peace river.

Very good timber is found near the delta of the Athabaska and Peace rivers though the area it covers is not very large, but the best timber in all the northwest is along the Slave river and on the Liard and its tributary, the Nelson.

MACKENZIE RIVER.

Even on the MacKenzie river almost to the Arctic ocean, the country is well timbered and every man who has travelled down this river has remarked on the wonderful growth of the trees one hundred miles within the Arctic circle.

NORTH OF MANITOBA, AND EAST OF SASKATCHEWAN.

The timber of this district (formerly part of Keewatin), although there is little or none that has not been burned over, is far superior to the country just west of it in Saskatchewan.

FOREST FIRES.

The forest fires, however, have perhaps been more destructive in this district than in any other part of Canada. As will be seen in the more detailed account of the country farther on, the loss by fire has been enormous and most of the country has been burned over many times.

As long ago as 1878 Dr. Robt. Bell (Geol. Rep., 1879) says: 'Up to 1878 the great region covered by the report had been annually devastated by forest fires, ranging over large areas and destroying the timber in different localities from time to time, until, perhaps, more than half of it is already swept away. In that year I made a point of calling the attention of the Indian chiefs and head-men to this great waste, and informed them that it was the wish of the government that the timber (which the Indians had not before considered of any value) should not be thus destroyed, and requested them to make their temporary fires on the beach or the bare rocks, and to extinguish their camp fires in all cases before leaving. This they all promised to attend to and the result has been that during 1879 no forest fires, as far as I could learn or observe myself, had occurred. The saving thus effected is worth to the country many times more than the cost of our explorations.' The Indians, however, seem to have soon forgotten Dr. Bell's wishes, as no mention was made in later years as to the prevalence of forest fires being on the decrease.

8 EDWARD VII., A. 1908

Mr. Wm. Beech, of Fort Churchill, whose evidence on the timber of this portion of the northwest is referred to further on, says: 'I think that timber notices should be printed in Cree and Chipewyan so that those Indians might know and be careful of the timber. Notices as regards fire are sent in English, why not in Cree and Chipewyan? They have a type of their own and can read their own languages. They have books and I have seen their prayer books and bibles. Cree Indians are very good people.'

Mr. McInnes (Geol. Sur. Rep., 1906), speaking about the country near Burntwood river says that occasional white spruce and tamarack attain diameters as great as 18 inches, and adds that these are trees that have escaped when the surrounding forest was burned and are sufficient evidence that, but for the repeated fires, there would be large areas covered with good timber.

DETAILED ACCOUNT—HAYES RIVER.

In this district the Hayes river valley possesses the best timbers but in the country north the timber gradually deteriorates till along the Churchill there is very little good timber.

In 1884 Dr. Klotz explored the lower part of the Hayes. He noticed that there was more and larger poplar (5 to 7 inches) here than on the Nelson opposite. 'It is very marked that the woods on this route are far better than on the Nelson and there is a greater proportion of tamarack (probably one-third). Many trees (spruce) would measure 12 inches in diameter.'

KNEE LAKE.

On the south side of Knee lake there is some fair sized spruce, balsam, tamarack and birch. The birch increases in size as we proceed westward.

STURGEON CREEK.

The Shamattawa river is a tributary of the Hayes. Sturgeon creek is a tributary of the Shamattawa. Wm. Beech, a pioneer settler at Churchill, who has travelled all through this country, says (1908) the Hudson Bay people get their timber for manufacturing their boats and buildings at Sturgeon creek. He says the timber is from 12 inches to 1½ feet.

GOD'S LAKE.

God's river, a tributary of the Shamattawa, is the outlet for God's and Island lakes. A. S. Cochrane (Geol. Sur. Rep., 1878-79), reported the timber around God's lake as more than half burnt over, while the timber around Island lake was still green. Spruce, the most abundant wood everywhere, attains in many places a very good size and is used in the form of logs and beams for building purposes. The tamarack and banksian pine sometimes have a diameter of about 20 inches. Balsam fir is common and of good size around Island lake, some of the trees measuring nearly four feet in circumference, but it is scarce at God's lake and only rarely seen and of small size as far north as Knee lake.

MOLSON LAKE.

Mr. Beech estimates that at Molson lake, the head waters of the Hayes river, there were twenty million feet of spruce timber.

APPENDIX No. 2

NELSON RIVER VALLEY.

Northwest of the Hayes is the valley of the Nelson river. The timber along the lower part of the Nelson does not compare favourably with the timber along the lower part of the Hayes. Throughout its whole length spruce and poplar predominate. Aspen poplar, says J. B. Tyrrell (1896) is the commonest deciduous tree, as it grows on the drier uplands everywhere, occasionally forming beautiful forests, but more often, and especially towards the north, partly covering the surface with scattered groves of small trees.

Wm. Beech reports districts of good firewood from Flamborough Head to Owl river.

NISKI LAKE.

The first river of any size running into the Nelson is the Kisemitiskun or Old-Fish-weir river. J. B. Tyrrell in 1894 was at Niski lake, the headwaters of this river. The north shore he found covered with a rich growth of dark evergreens. The banks, close to the water's edge, are clothed with white and black spruce and some small poplars.

LIMESTONE RAPIDS.

The next river is the Limestone or Mittitto river. At Limestone rapids, says Dr. Klotz, (Interior Rep., 1884), the spruce is small, although some trees measure 7 to 10 inches, and back from the river it is smaller still. The little poplar that is found is scrubby. The Limestone river runs almost parallel with the Nelson to the north. The country from the Niski lake, the headwaters of the Old Fish-weir river, to the headwaters of the Limestone through the long chain of lakes, is described by J. B. Tyrrell (1894) as thickly wooded with small timber and towards Cat Fishing lake much of the timber had been killed by fire. On the upper part of the Limestone he found the best timber. He says, 'These banks are wooded with tall white spruce which looked very beautiful after the monotony of the stunted black spruce forest.'

GULL LAKE.

Below Gull lake the woods, says Dr. Klotz, are somewhat better and almost exclusively spruce, but there is no merchantable timber. From here to Split lake the wood is small, much thereof being *brulé*.

SPLIT LAKE.

The islands in Split lake, he says, as well as the shores are wooded, chiefly with spruce, some tamarack, poplar and birch; the wood is somewhat better than on the Nelson, averaging probably 7 inches in diameter. Owen O'Sullivan (Geol. Rep., 1904) says that here the trees, chiefly black spruce, are from 4 to 10 inches in diameter.

ASSEAN LAKE.

North of Split lake lies Assean lake, and some way north of this again is Waskaio-waku lake.

The shores of Assean lake, says Mr. O'Sullivan, are well wooded with black spruce, tamarack and white birch. A fire that occurred two years ago ran from its southeastern end for several miles eastward.

Wm. Beech reports that from Split lake to Waskaio-waku lake there is good timber, spruce and some tamarac, one foot to 15 inches in diameter and 30 feet high.

8 EDWARD VII., A. 1908

From Split lake west the country is divided into three river valleys, the Burntwood being the most northerly, the Grass river occupying the centre and the Nelson the most southerly part.

BURNTWOOD RIVER.

J. B. Tyrrell (1896) says that on the northern part of the Burntwood river white spruce is rather scarce.

Wm. McInnes (Geol. Sur. Rep., 1906), describes the timber in this river. He says the forest is a mixed second growth, mainly spruce and tamarack varying in age from recent *brulé* to 50 years. Along the lower part of the river but little timber left is of a size larger than 8 inches in diameter, three feet from the ground. All the drier parts denuded of old forest by the repeated fires that have swept over the region, being covered by forest of only ten years' growth or younger.

ODEI RIVER.

To the north of the valley of the Odei or Heart river, which flows into the Burntwood river from the west on the left bank eight miles from the mouth, is a rolling, forested country. Here, he says, the forest is mainly spruce and tamarack of about sixty years' growth, the larger trunks reaching diameters of from 8 to 10 inches, but the general average not more than 6 inches. In the valleys occasional white spruce and tamarack attain diameters as great as 13 inches. These are trees that have escaped when the surrounding forest was burned and are sufficient evidence that, but for the repeated fires, there would be large areas covered with good timber.

From here to Pipestone lake the recurring forest fires have not only denuded this section of its trees, but even the stumps have for the most part been burnt away, so that it is now covered only by an open growth of small white birch, poplar, willow and banksian pine, with an undergrowth of vetches and grasses and small shrubs diversified here and there, by small open tracts. Where the grass covered surface is free from trees, this country often presents quite a park-like aspect.

From here to Waskwatin lake the low flat along the river is covered by a sixty years' growth of timber, mainly of banksian pine and spruce. The higher plateau is wooded principally with spruce from 6 to 8 inches in diameter, with scattered banksian pines, poplars, and white birches succeeding an earlier burned forest that was even younger when destroyed, and this following a still earlier, that by the stumps, is shown to have been somewhat larger. Evidently this country has been subjected to repeated burnings that have followed one another, often at intervals of comparatively few years.

WASKWATIN LAKE.

Waskwatin lake is described by J. B. Tyrrell as 'wooded with white spruce and poplar. A supply of timber for building and fuel could be obtained from the surrounding country.'

A mixed second growth forest, says Mr. McInnes, mainly aspen poplar, covers all the uplands, while on the islands and on low flats bordering bays of the lake are found white spruces and poplars of diameters up to one foot.

Continuing along the Burntwood river, Mr. McInnes describes the country as being of the same general character for thirty miles, 'covered for the most part with a mixed second growth from ten to thirty years old, but with here and there, clumps of white spruce, with tall and straight trunks, a foot or more in diameter.'

FOOTPRINT LAKE.

At Footprint lake the greater part of the flats and practically all the highland have been burned over within twenty years, and are clothed now with an open growth of small mixed timber.

APPENDIX No. 2

Southward of the most southerly head of the Burntwood river the country is wooded with banksian pine, poplar and spruce.

NELSON HOUSE.

At Nelson House, J. B. Tyrrell in 1896, said that timber for house logs had to be collected from scattered groves and brought several miles up or down the brooks or across the lake.

FILE RIVER.

From the Burntwood lake along the File river, which is really another name for the upper part of Burntwood river, J. W. McLaggan of Strathcona, Alta., (Hudson Bay route, J. A. J. McKenna, 1906) says that with the exception of a bunch of spruce of about half a million feet, averaging 12 to 14 inches in diameter, there was seen nothing but small, scrubby, mixed timber of but little value. The country back from the river has been burned over.

GRASS RIVER.

South of this is the valley of the Grass river which covers a much larger area than the Burntwood, and the timber, where not destroyed by fire, is much better, but nearly the whole area has been burned over. As long ago as 1879, Dr. Robert Bell (Geol. Rep.) says that in places along the route the woods are burnt, but most of the timber at that time appeared to be green, and of a hifty growth, the spruce sometimes measuring over 6 feet in girth which is equivalent to a diameter of 2 feet.

PAINT LAKE.

At Paint lake, along the lower part of Grass river, the islands are covered with small mixed timber. On the south side of the lake there is a fairly good bunch of spruce, suitable for railway ties or pulpwood. Back from the lake the country has been burnt over but is growing up again with poplar and other trees.

Between Paint and Setting lakes he says there are small bunches of spruce and poplar, but back from the river the country has been burned over.

SETTING LAKE.

Along the shores of, and on the islands of Setting lake there is, Mr. J. W. McLaggan estimates (Hudson Bay route, 1906, J. A. J. McKenna) about ten million feet of young, sound, clear spruce timber, averaging from 12 to 14 inches in diameter.

Below the rapids of Grass river the country has been burned over leaving only a few bunches of spruce.

J. B. Tyrrell mentions (1896) that the Rowan or mountain-ash grows freely and has an abundant crop of berries especially around Wikusko and Reed lakes.

HERB LAKE.

From the rapids to Herb lake, says Mr. McLaggan, there are small bunches of jackpine and tamarack, and on the north side of the lake there are spruce and poplar fit for railway ties and pulpwood; but back from the lake and the river the country appeared all burned. Mr. McLaggan expresses the opinion that there must have been a good timber area bordering these waters, and that, if fire can be kept out, reforestation will soon be effected.

REED LAKE.

From Reed lake north to Methy lake, he says the timber is mainly jackpine and tamarack of small size, a limited portion of which would be fit for railway ties.

8 EDWARD VII., A. 1908

From Red lake west to Elbow lake he saw about two million feet of good spruce and poplar, averaging from 12 to 14 inches in diameter.

South of Reed lake he passed through low and swampy country covered with scrubby timber. About a million feet of medium-sized spruce was sighted; the country was found to have been burned over and growing poplar was found, which in a few years would make good pulpwood.

From Cranberry to Athapupuskow lakes he reports a poor growth of scrubby timber.

UPPER NELSON RIVER.

We will now return to the Nelson river which we have already followed to Split lake.

Above Split lake, says Dr. Klotz (Interior Rep., 1884) the spruce is only about 4 inches in diameter. The lower limbs soon die from the growth of moss thereon, leaving only a green top. Tamarack which elsewhere generally grows in swamps, is found here on the bare rock.

SIPIWISK LAKE.

The whole surface around Sipiwick lake, he says, is wooded principally with spruce, some tamarack, pitch-pine, birch and poplar. Spruce sticks there are of 10 inches, yet the exception rather than the rule.

MUHIGAN LAKE.

The country along the Muhigan river, says J. B. Tyrrell, (1896) has all been burnt over and much of it is now almost treeless, like partly open prairie, with scattered groves of small poplars and alders.

ECHIMAMISH RIVER.

The country along the Echimamish river, says Dr. Robert Bell (Geol. Sur. Rep., 1879), is very swampy and wooded with spruce, tamarack, banksian pine, white birch, aspen, balm of Gilead, and willow, with a little balsam fir.

In the country north of Norway House the woods, according to Dr. Klotz, are good, affording 12 inch spruce sticks. There is considerable balsam also. The country is, he says, all wooded but not a forest country.

ROSS ISLAND.

Dr. Robert Bell reports in 1878 that at that time a small area of the timbers had been preserved on the west side of Ross island, where the West river enters Big-reed lake and here many of the white spruce measured three feet in diameter. Even the most rocky tracts support a growth of trees large enough to be of value for many purposes.

NORWAY HOUSE.

Dr. Klotz says that at Norway House, north of Lake Winnipeg, the woods consist of spruce and poplar and some scattered birch and pitchpine. A good stick of timber would be about 9 inches at the butt.

GUNISAO RIVER.

The Gunisao river is to the northeast of Lake Winnipeg but it flows into the Nelson river above Norway House. According to J. B. Tyrrell (1896) the banks are wooded with beautiful, tall, white spruce, apparently forming a magnificent con-

APPENDIX No. 2

ferous forest, but how far back from the river this forest extends was not determined. There is certainly here a large quantity of valuable timber, much more than was seen anywhere in the country immediately east of Lake Winnipeg, for most of the surface farther south has been swept by extensive forest fires within the last decade.

To the northwest of Lake Winnipeg are a number of lakes which belong to the Saskatchewan water system.

From Cranberry to Athapuskow lake Mr. McLaggan, (Hudson Bay route, 1906, J. A. J. McKenna), describes the timber as poor and scrubby. Some small bunches of spruce were seen along Athapuskow lake near the portage, and by Goose river, but the country has been all burned over, leaving only small clumps of spruce.

GOOSE LAKE.

The greatest part of the country on the upper end of Goose lake has, he says, been burnt over, leaving only clumps of spruce and poplar.

COWAN RIVER.

After crossing Black Duck lake on the upper parts of the Cowan river he reports scattered bunches of spruce and tamarack of a size suitable for ties or pulpwood.

Along Cowan river he describes the country as low and flat, with small quantities of good spruce timber in spots until within a few miles of Black Duck lake, when bunches of good spruce, estimated at ten million feet, come into view.

CORMORANT LAKE.

On the north side of Cormorant lake, and along the creek which connects it with Lake Yawingstone, and on the south side of the latter lake he saw from three to five million feet of good milling spruce timber.

CHURCHILL RIVER VALLEY.

North of the Nelson River valley lies the valley of the Lower Churchill river.

Owen O'Sullivan in the Geological Survey Report (1906) of his trip in 1904, says wood is scarce at Churchill. The Hudson's Bay Company obtain their fuel supply from a ravine three miles distant in a southwesterly direction where black spruce averaging 5 inches in diameter is found.

W. Thibaudeau, C.E., in the 'Hudson Bay Route,' 1906, by J. A. J. McKenna, also says there is no merchantable timber in the vicinity of Churchill, although there is an ample supply of timber for fuel purposes for many years along both banks of the Churchill and around Button bay.

SEAL RIVER.

Travelling northwest from Churchill, Dr. Robt. Bell in 1879 (Geol. Rep.) says that spruce and tamarack are found growing near the sea-coast in favourable situations as far as Seal river beyond which their northeastern limit curves inland.

EASTERN WOODS.

J. B. Tyrrell in 1893 went from Churchill to York. Almost due east from Churchill he came to the Eastern woods, so called, where Wm. Beech says there is some good wood. Most of the country crossing Salmon creek, Broad river and Owl river is open plain.

8 EDWARD VII., A. 1908

BROAD RIVER.

Wm. Beech, however, says that on Broad river there is heavy timber 10 to 15 inches within ten miles of the coast, and, he adds, it is a great pulpwood country.

W. Thibaudeau, C.E., who went over much the same ground as Mr. Tyrrell, does not speak of seeing any timber except four miles from Churchill where he says there is spruce from 6 to 12 inches, and at Broad river where there is a strip of about four miles by one-third of a mile wide; there is stunted black spruce from 8 to 14 inches and he reports the balance of the country is open, level, plain perpetually frozen.

CHURCHILL RIVER.

On the main Churchill river, above its mouth, to Deer river, Beech says there is some good spruce from 7 to 15 inches in diameter. The country back from the Churchill appears to be generally poorly timbered.

DEER RIVER.

J. B. Tyrrell reports the sides of the Deer River valley are at first thinly wooded, but as the river is ascended the timber becomes much thicker and heavier. Inland the country is generally open, but thinly wooded in places. Beech reports that the timber extends fifty yards only all along the Deer river. On the upper stretches the trees range from 12 to 20 inches in diameter. Owen O'Sullivan (1904) states that this whole region has been overrun by fire. Bunches of spruce and tamarack that escaped the fires were frequently met close to the water's edge. About half-way down he came to the open mossy plain which extends northward to the well wooded banks of the Great Churchill.

OWL RIVER—NISKI LAKE.

J. B. Tyrrell found the almost continuous forest began before reaching the ancient shore line between the Deer river and Owl river. At the head of Owl river he found the remains of a forest fire eighteen years old. Between this and Niski lake, the source of the Kisemitskun river which flows southeast to the Nelson, the country was thickly wooded mostly with black spruce.

W. Thibaudeau, says that from the headwaters of the Deer to the Churchill, the country is covered with scrub spruce and tamarack from 4 to 6 inches in diameter. There is no timber where they reached the Churchill river, and from here along the east side of Little Churchill there is some timber from 6 to 14 inches in diameter.

LITTLE CHURCHILL.

Speaking of the lower part of the Little Churchill Dr. Robt. Bell in 1879 says the timber below the Recluse lakes is burnt all the way to the Great Churchill. In 1904, Owen O'Sullivan says of the same country that from Recluse lakes northward the country, which has been overrun by a fire that occurred some forty years ago, is now partly covered with bunches of second growth black spruce, tamarack and white birch.

Of the upper part of this river Dr. Bell reports the country as 'generally green' or unburnt. The timber, however, does not seem to be very good as Owen O'Sullivan speaks of it as covered with black spruce, white birch and tamarack of small size. Near Waskaiowaku lake there is some black spruce averaging 8 inches in diameter.

WASKAIOWAKU LAKE.

Owen O'Sullivan reports the forest growth around the lake as chiefly black spruce and white birch of from 4 to 14 inches in diameter, while Thibaudeau reports

APPENDIX No. 2

it slightly larger. Thibandeau says also the ridge between here and Split lake was thickly wooded with spruce from 4 to 10 inches.

SASKATCHEWAN.

CONDITIONS AND EXTENT OF THE TIMBER.

The extreme east of Saskatchewan and extreme west of what was till lately part of Keewatin has the poorest timber of all the northern forest country. South of the Saskatchewan, is the prairie. Directly around the Saskatchewan it is flat and swampy. Travelling north you almost immediately come to the rocky sterile country. This country extends to the barren grounds across the Churchill, Reindeer lake, Cochrane river and on to the Kazen river which flows through the barren lands. The good timber in Saskatchewan is confined mainly to the country north and northwest of Prince Albert.

FOREST FIRES.

Fires have been very destructive in Saskatchewan also. R. S. Cook, of Prince Albert, in his evidence before the Senate Committee, 1907, says, 'There is no calculating the amount of the timber that has been destroyed, and the very best spruce at that. The government are now taking steps to try and put a stop to the burning. They have fire fighters out there during the dry season, but it is such a vast country it is a very difficult matter.'

In the rocky country along the Churchill where the soil is poor the forest fires do not turn the country into prairie as they do along the Beaver. Around Cold lake, on the border of Saskatchewan and Alberta, R. S. Cook says the fires have been very destructive but there has been good timber there. Mr. Eberts, who traversed this country exploring the proposed route of the C.P.R. says (Dominion Pacific Railway report, 1880) 'that the whole of this district (south of the Beaver) was originally forest, but at present a strip of from five to twenty miles along the Saskatchewan is chiefly prairie and to the north, large open tracts were interspersed through the forest land. These prairies and open tracts were no doubt the result of the fires.'

Fires, says Mr. Cook, have been very destructive at Montreal lake and about two-thirds of the timber immediately around Stanley Mission has been destroyed by fire. Archdeacon McKay says that in some places the timber has been destroyed by fires for the time being, particularly in the rocky country. The fires seem to be more destructive in that class of country than in the other part.

EASTERN SASKATCHEWAN.

From all accounts there is little or no good timber north of the Saskatchewan river in eastern Saskatchewan. From the Dom. Pac. Ry. reports of 1880, we learn that 'Banksian pine is prevalent on the sand-hills and ridges, but seldom attains a foot in diameter. Birch and willow are numerous but of little value except for fuel. North of latitude 55 extending to Churchill river the whole country is described as being absolutely barren consisting of Laurentian rocks in which, however, there are great possibilities of mineral wealth.

Banksian pine of small size scattered over the rocks and here and there groves of small spruce in marshy spots were met with.

NORTHERN SASKATCHEWAN.

J. B. Tyrrell in 1894 explored the lakes and rivers of northern Saskatchewan, Reindeer lake and river, Cochrane river, Geikie river and the country north to beyond the tree limit. In hardly any part did he find good timber. Reindeer river

8 EDWARD VII., A. 1908

appears to be fairly well wooded. 'In some parts the river flows through low bottom-land wooded with small spruce and tamarack behind which rise the rocky ridges.' At Reindeer lake the growth is still poorer 'a few pines and spruce cling to the brown, lichen-covered rocks.' The growth north of this is very poor.

COCHRANE RIVER.

On the portage to the headwaters of the Thlewiaza river, says Mr. Tyrrell, is a grove of fine, tall, white spruce, the best spruce seen on the banks of the Cochrane, and here the Indians seem to resort regularly to obtain wood for their canoes, while birch bark can be procured from trees on the same sandy ridge a short distance farther north.

BLUE LAKE.

North of this again at Blue lake he writes, 'The hillsides are wooded with large white spruce up to 76 inches in circumference (Geol. Sur. Rep. 1896) three feet from the ground. The western side is wooded with white and black spruce, birch, alder, willow and straight aspens 4 inches in diameter,' the first of these latter trees seen for a long time.

ENNADAI LAKE.

At the south end of Ennadai lake the hills are usually wooded but within a few miles the forest disappears or becomes confined to the ravines and the hillsides are bare. On the Kazen river which is north of the tree limit, Tyrrell says 'there are a few groves of larch of fair size.'

CONTRADICTIONARY EVIDENCE.

Of the country from Lac la Ronge south there has been much contradictory evidence. Surveyors and explorers who have been over the country, J. B. Tyrrell and different men sent out by the government (Dom. Pac. Ry. Report) say that there is no good timber there, while Archdeacon McKay and R. S. Cook, of Prince Albert, say there is much good timber.

J. B. Tyrrell (1892) says 'South of Lac la Ronge there is some improvement in the timber. On Montreal river small Banksian pine cover the country. No large timber, spruce or pine, is seen till near the lake, when on the southern end some groves of large spruce were seen. Montreal mountain appears to be more than half burnt over. The largest timber is seen on the watershed south of Montreal and Deer lakes.' Mr. O'Keefe in his exploration in 1879 (Dominion Pacific Ry. Rep.) says, 'Along English river, in this section, nothing but rock, sand and swamps is recorded.' Mr. Clarke, his assistant, made an excursion south of Lac la Ronge and he said that 'In the northern part there are small sections of fair land south of Lac la Ronge and surrounding Egg lake. Around the latter lake there is a belt of fine timber, consisting of tamarack, poplar and in places balsam.'

Archdeacon McKay and R. S. Cook (Senate Committee Report, 1907) however, speak very highly of the timber here. The latter writes that 'to the west of Lac la Ronge the country is all timbered—in some places heavy timber. There is spruce and poplar. The spruce is good enough for lumber and of course it would do for pulp-wood. As to the country around Lac la Ronge there is timber all through it, wherever it has not been destroyed by fires.'

Archdeacon McKay explained that he put up a sawmill at Lac la Ronge in the year 1906, and it is run by water power. The logs that are sawn there are the kind of timber found in that part of the country. They average seventeen logs to the thousand feet. They will be logs 14 to 15 feet long. The diameter would be about

APPENDIX No. 2

two feet across at the butt-good, large logs, clean timber, very much the same timber as at Prince Albert. This good timber is scattered all over the country sometimes for miles.'

Owing to this contradictory evidence it is pretty hard to accept a fair estimate of the timber here. Archdeacon McKay of course may be speaking of a much more limited area than the explorers who probably take a general estimate of the whole country.

There is no doubt that there is good timber between Lac la Ronge and Prince Albert.

TIMBER NORTH OF PRINCE ALBERT.

R. S. Cook says that down through the region immediately north of Prince Albert and on through to Montreal lake, it is pretty much a timber country. Dr. Hugh Bain of Prince Albert (Senate Report, 1888), says, 'Immediately north of us we have a large belt of timber, chiefly spruce, and also a good deal of poplar.' He also says that the true forest just touches the river at Prince Albert. At the present date, twenty years later, Archdeacon McKay says it is all forest practically until you get about thirty miles from Prince Albert. The forest fires have no doubt cleared much of the forest off for thirty miles during that twenty years.

D. C. O'Keefe in the Dominion Government Pacific Railway Report, 1880, says that 'North of Prince Albert and west of Cumberland House to longitude 107° 30' much timber was observed. In the south-western part poplar copse prevails, gradually, emerging into continuous poplar forest which attains its greatest development to the east of Stinking lake. The balsam and poplar in groves is of large size, in many cases two feet in diameter. Extending eastward from Stinking and Pelican lakes, fine groves of spruce are frequently mixed with aspen and balsam-poplar, and, on the borders of the swamps, groves of tamarack of all sizes up to 18 inches in diameter are found.

This well-timbered region also extends first northwest and then west along the Beaver river.

R. S. Cook twenty years later, says that 'passing down the Beaver river and southeast towards Prince Albert, there is a large quantity of very good spruce. Witness said that the fires had been very destructive and burned off a good deal of the top soil. Where that top soil is gone the country is of very little use. It is growing up with black birch and second growth poplar. There are openings but to no great extent.'

PRINCE ALBERT TO GREEN LAKE.

Professor Macoun in the Senate Report, 1888, speaking from actual observation, says 'there are immense groves and timber of excellent quality lying between Prince Albert and Green lake. Very excellent groves of white and black spruce are found in that country. Of course when I speak of timber I mention only black and white spruce and jackpine as we call it, that is scrub pine, only it grows very large up there. These are the trees that are of economic value, besides the balsam poplar, and it only grows on the islands and alluvial bends along the river bottoms. When you come to the route of Green lake there is two days' journey through a magnificent country, beautifully timbered. Crossing the Saskatchewan at Carleton, for two days you travel through a prairie country with bluffs here and there. Then you travel for two days through a forest to Green lake. It is a dense forest.'

GREEN LAKE.

Speaking of Green lake he says: 'Timber of this section is of very fair quality, consisting of spruce, poplar and tamarack.'

STINKING AND PELICAN LAKES.

From Stinking or Witchikan lake to Pelican lake Mr. O'Keefe (Dominion Government Pacific Railway Representative, 1880), says 'continued our course through spruce and tamarack woods of fine timber averaging 20 inches in diameter and from 50 to 60 feet high, which continued for two and half miles, then poplar with birch, spruce and tamarack prevailed.' Mr. Eberts, speaking of the country west and north of Pelican lake says, 'this is the southern limit of the true forest. The timber is large, consisting of spruce, balsam, poplar, banksian pine, and a few trees of yellow pine from 12 to 30 inches in diameter.'

BEAVER RIVER.

Mr. Eberts explored from here in a northwest direction on the watershed between the Beaver and the Saskatchewan in the year 1879 (Dominion Government Pacific Railway Representative). 'The indications suggest that the whole of this district was originally forest, but at present a strip of from five to twenty miles along the Saskatchewan is chiefly prairie. To the north large open tracts are interspersed through the forest land. The standing timber consists of poplar and spruce of good size, with banksian pine on sandy soil.' Since this time, nearly thirty years ago, much of this timber has been burnt as R. S. Cook says that around Cold lake on the border of Saskatchewan and Alberta the fires have been very destructive although there has been good timber there.

WESTERN SASKATCHEWAN.

Travelling north from here the timber gets poorer. Mr. O'Keefe describes the country inland from Doré river, a tributary of the Beaver, as sterile but river banks well wooded with spruce. South and west of Lac la Plonge are sandy plains, muskeg and tamarack swamps, while southeast there is some good tamarack and spruce.

ILE A LA CROSSE LAKE.

Bishop L. F. Lafleche (Senate Report 1888) says 'the vegetation (of Ile à la Crosse) has a poor appearance and can offer no advantage for the working of the forests. Autumn fires have devastated them considerably. The principal species of wood are the cypress which hardly attains a diameter of a foot and a half at the butt, the spruce, white and red, the birch, the poplar, &c.' In 1879 Mr. O'Keefe reports 'From the southeast end of the lake (Ile à la Crosse) we penetrated (east) to Burnt Mountain.' He found a fair growth of banksian pine, poplar and birch and in places tamarack. Then he found a barren plain country similar for twenty miles north and south. Hon. Wm. Christie (Senate Report, 1888) reports that from Ile à la Crosse lake to Portage la Loche the whole country is rock and islands covered with small trees.

Professor Macoun (Dom. Govt. Pac. Ry. Rep. 1877-78) says that much of the land in the vicinity of Methy and Buffalo lakes is covered with banksian pine and may, therefore, be set down as very poor and sandy. In the more elevated country only, he observed balsam, spruce and even there it was of rare occurrence.

The Churchill river was for over 100 years the canoe route for the voyageurs and explorers travelling to the Mackenzie valley, Sir Alexander Mackenzie, Sir John Richardson, Sir George Simpson and others. All speak of the Churchill as a rocky country of small trees or else do not mention the trees at all.

APPENDIX No. 2

ALBERTA.

Leaving the province of Saskatchewan by the Clearwater river you enter Alberta and the timber gets somewhat better.

W. Ogilvie, D.L.S. (1892), speaking in a general way of this district says that as a rule the trees are much smaller than people in the eastern provinces are accustomed to see made into lumber.

FOREST FIRES.

He says that owing to its position the resources of the upper part of the Athabaska river stand a chance of being utilized much earlier than those on the lower river. He continues, 'I am sorry to say, however, that long before it will be necessary to resort to this, much of it may be burned, as such is the case along the trail between Edmonton and the landing. In 1884 I passed over this trail twice and then saw many groves of fine spruce, but last summer I saw that much of the best of this timber had been completely burnt off. Then the country in the immediate vicinity of the landing was all heavily timbered, much of it merchantable. Last summer especially in the Ta-wat-an-a-velley and vicinity, the country resembled prairie nearly as much as the country in the vicinity of Edmonton does.

CLEARWATER RIVER.

T. Fawcett, D.T.S., made a survey of the Clearwater river (in 1888) and connecting waters to Cumberland House following the old canoe route. He reports the valley for the greater part of the distance is thickly timbered with balsam poplar, white poplar and birch. A few good trees are found, but those suitable for manufacture only in small numbers. The balsam poplar grows to an average size of from 6 to 24 inches in diameter, straight and free from limbs, but the timber is not of much value. About sixty miles up the stream banksian pin is scattered among the other timber, and the soil becoming sandy, scrubby pine is plentiful. Black spruce and tamarack also occur but are somewhat scarce. Towards the top of the banks the timber is much smaller.

CONDITION OF THE TIMBER ON THE ATHABASKA RIVER.

Leaving the Clearwater you enter the Athabaska river. Many years ago there was evidently some very good timber on the river, but now the fires have destroyed a large proportion of it. The upper or southern parts have the poorest timber. As you go north the trees get larger until in the delta you find excellent timber.

In the report of 1888, Wm. Ogilvie gives a description of the different trees of this region. The spruce and poplar found in about equal quantities, greatly outnumber all the others; spruce generally found in groves by itself, seldom exceeds 12 to 14 inches in diameter, and from 100 to 120 feet in height; poplar generally small but found on many of the flats of a good size. Of the other species of trees he says the white birch, the only hard wood in the country of any use, is small and crooked and seldom more than 6 or 7 inches in diameter; the pitch pine generally small and scrubby and of little or no value; the tamarack scarce and generally small only found in marshes and a great deal of it hollow and unsound at the heart. Still he says that all the way down to the lake the country is or was, thickly wooded. W. F. Bredin, of Lesser Slave lake, twenty years later says (Senate Report, 1907), the valley of the Athabaska from where the McLeod river empties into it, to the Grand rapids, a distance of about 300 miles, is mostly timbered with small timber, poplar and spruce, not scrub exactly but not much saw timber. Professor Macoun (Senate Report, 1888), says that all the branches of the Athabaska and the Athabaska river itself,

8 EDWARD VII., A. 1908

have excellent forests in many places, sometimes continuous for very many miles. Then at other times the forest is poor and in some places nothing but small poplars. The whole region may be taken as a forest country that will produce economic timber. The same may be said of the country up towards the base of the Rocky mountains, at the source of Smoky river. Mr. Bredin says that the timber might have been fairly good at one time, but now it is fairly scattered and a great deal of it is grown up with second growth. From the McLeod river to McMurray the timber is poor while from McMurray to Lake Athabaska there is some improvement.

EDMONTON.

The wooded country of the upper Athabaska is just north of the great prairies that extend as far as Edmonton.

LAKE ST. ANNE.

J. McEvoy (Geological Report, 1897) says the prairie region that exists around Edmonton gradually disappears towards the west and before Lake St. Anne is reached the country is to a great extent covered with a thick growth of poplar and cottonwood. H. A. Macleod (Dom. Govt. Pac. Ry. rep., 1875) says that from Edmonton to the Rocky mountains the poplar becomes larger, but decreases in quantity, and spruce appears more frequently with pitch pine and balsam till the woods are entirely made up of those species. He says that the poplar in the northwest appears to be of better quality and closer in the grain than that found in Ontario, resembling soft maple and makes very good firewood.

LOBSTICK VALLEY.

Again, in the Pacific Railway report, 1880, he says there were a few small prairies in the Lobstick valley, the rest of the country being covered with timber mostly of the original growth, a large proportion being of good size and fine quality, but brulés and windfalls were numerous and very extensive in this section of the country. Marcus Smith (Pacific Railway report, 1877-78) reports the spruce and poplar of good size. Twenty years later (1897) J. McEvoy gives a much less favourable account of the timber. 'Burnt and green woods of spruce and cottonwood alternate along the way. Fallen timber is plentiful throughout. Thick small timber was seen, but the greater part has been killed by fire.'

MCLEOD RIVER TO ATHABASKA RIVER.

Continuing he says that all the country from the McLeod to the Athabaska river had been overrun by fires a few years before and much of the timber destroyed had been of a merchantable size. It was then a wilderness of bare trunks.

ATHABASKA VALLEY.

As the bottom of the Athabaska valley was approached he found smaller and more scattered timber. Beyond this, at Cache Pecotte, four miles above Sandstone creek and below Brulé lake, the Athabaska valley was to a great extent an open grass country, having in parts a light growth of scattered pines and some heavier spruce woods.

MALIGNE AND ROCKY RIVERS.

Before reaching the Rocky mountains Mr. McLeod found on the Maligne and Rocky rivers much rough wooded country, much of the timber fallen.

APPENDIX No. 2

JASPER HOUSE.

Professor Macoun (Pacific Railway report, 1877-78) says that not many miles northwest of Jasper House the aspect of the mountains changes, the slopes lose their wood and become clothed with grass instead of spruce forest, and the plain instead of being a continuous forest changes its characteristics to those of park and meadow land.

BAPTISTE'S RIVER.

Professor Macoun, in his 'History of the Great Northwest,' 1882, says there is an abundance of fine timber of various species on Baptiste's river.

LESSER SLAVE LAKE.

The Lesser Slave lake region lies between the Athabaska and the Little Smoky river.

H. A. Conroy reports (Senate Committee, 1907) that some parts of this district are heavily timbered, while other parts are open. There is an Indian reserve along the Little Slave river and a portion of that has good timber. He says that the Indians have the finest piece of timber on the Lesser Slave lake as a reservation. The spruce is large, and there is a species of poplar that they call the black bark poplar which grows very large in that vicinity. Mr. Conroy has seen it from 3 to 4 feet across the stump and 50 and 60 feet high on this low land. The north side of Lesser Slave lake, he says, is covered with quite a heavy second growth of poplar from 9 to 12 inches through and very slim and tall, and with some spruce, but not to any extent. North of this he says there are twenty miles of a rolling prairie country which appears as though it had at one time been burnt and the timber destroyed.

LESSER SLAVE LAKE TO WHITEFISH LAKE.

About half way between Lesser Slave and Whitefish lakes you strike a timber belt running from that to Whitefish lake, and there is a great deal of poplar and some spruce, where Mr. Conroy has seen logs two feet through.

LITTLE SLAVE RIVER TO ATHABASKA LANDING.

From Little Slave river to Athabask Landing he says the banks of the river are fringed with timber, probably half a mile to two miles wide. The spruce is fairly large; in some districts fit for sawlogs, and mostly all fit for ties and small building timber. Some of it was very large spruce for that country, three feet across the stump.

LITTLE SLAVE RIVER TO McMURRAY.

W. Ogilvie reports (1888) the timber on the Athabasca from Little Slave river down to McMurray as generally small, although alders and willows grow to a size which would surprise people from the eastern part of the country. He has seen alders more than 8 inches in diameter and 30 feet high, while willows are often seen one foot in diameter, and he has seen one 16 inches. Elihu Stewart (1906) reports that the country along the banks from the landing down for some forty miles has suffered very much from fires. Below this point less damage has been done to the timber, which consists of poplar, birch, spruce, &c., the spruce being mostly along the river and its tributary streams. It is generally rather too small for lumber, though some belts contain trees of sufficient size for that purpose. The appearance from the steamer would indicate that generally the timber is of second growth. The spruce seems to be overtaking the poplar and will supplant it in time. This timber is well worth preserving from fire.

8 EDWARD VII., A. 1908

LAC LA BICHE.

East of Athabaska Landing is Lac la Biche the north shore of which Mr. Eberts (Pac. Ry. Report 1880) says is thickly timbered with spruce and poplar; the rest of the country covered with the last two trees and with banksian pine and tamarack.

For many miles north Mr. Stewart reports the timber as consisting of poplar, birch and some spruce, but none of the latter of good quality.

Past the numerous rapids from here to McMurray the standing timber is very small but nearly the whole district has been burnt over from time to time. There is very little large enough for lumber.

MCMURRAY TO LAKE ATHABASKA.

W. Ogilvie (1888) says that from McMurray down to the flats adjoining the lake the timber is nearly all spruce and poplar. There are a few ridges of pitch pine which possess no value. Occasionally a few white birch are seen. H. A. Conroy speaking of the present time (Senate Committee Report 1907) says that on the lower levels of the Athabaska through to Athabaska lake, there is heavy timber all the way along. The Indians told him that back from the river it is pretty muskeggy. He had been up the river every year for eight years. Taking the country as a whole there is quite a lot of marketable timber. All the lakes and rivers could produce good timber. There are millions of cords of spruce for pulpwood. W. F. Bredin also speaking of the present day says that it looks like a great alluvial plain from the river along from Fort McMurray to Lake Athabaska, 200 miles. That country is more or less timbered. He says that the country from McMurray to Lake Athabaska does not seem to have been as much swept with fires as the country south of that. J. W. Tyrrell who travelled through here in 1893 says that 132 miles below McMurray, the banks were thickly draped with spruce and poplar woods. Besides spruce and other varieties he saw balsam trees, the last seen on the northward journey.

BIRCH HILLS.

To the west of Athabaska river below McMurray are the Birch hills. Mr. McConnell (Geol. Report 1887-88) reports that on the Moose river to the Birch hills are small aspen, spruce and banksian pine. The timber on the Birch hills was largely destroyed by fires.

DELTA OF THE ATHABASKA.

In the delta of the Athabaska is undoubtedly the finest timber met with in going north from Edmonton to the lake. W. Ogilvie (1888) says that the spruce are generally much larger there than on the upper portion of the river, and much more free from limbs and knots and well suited for use. He says he saw nothing to compare with it in any part of the Territories (adjoining the prairies) through which he had been. For some three or four miles back of the lake, on the south side, there is nothing but willow and small poplar, which gradually merges into the large timber as we get back from the lake. Hon. Wm. Christie (Senate Report 1888) says that very good wood, useful for building purposes, can be got here. In later years travellers such as Elihu Stewart (1906) make small mention of the timber here, so probably it is not nearly so good as it once was.

PEACE RIVER COUNTRY.

PRAIRIE AND FOREST FIRES.

The Peace river though lying generally farther north than the Athabaska valley has a great deal more prairie along its banks than the Athabasca. Dr. Dawson (Geol.

APPENDIX No. 2

Report, 1879-80), says that the origin of the prairies of the Peace river is sufficiently obvious. 'There can be no doubt that they have been produced and maintained by fires. The country is naturally a wooded one and where fires have not run for a few years, young trees begin rapidly to spring up. The fires of course are ultimately attributable to human agency, and it is probable that before the country was inhabited by the Indians it was everywhere densely forest-clad. In its primitive state the surface was probably covered by a dense and heavy growth of coniferous trees. These forests having been destroyed by fire, a second growth chiefly aspen, but with much birch in some places, and always everywhere a certain proportion of coniferous trees, chiefly spruce, has taken its place. The aspen, being a short-lived tree, while the spruce reaches a great age and size, the natural course of events, if undisturbed, would lead to the re-establishment of the old spruce forests. The total area of prairie land, west of the Smoky river, may be about 3,000 square miles. The remainder of the surface is generally occupied by second growth forest, occasionally dense, but more often open and composed of aspen, birch and cottonwood with a greater or less proportion of coniferous trees. Some patches of the original forest remain, however, particularly in the river valleys and are composed of much larger trees, mostly coniferous, amongst which the spruce is most abundant. Handsome groves of old and large cottonwoods are also to be found in some of the valleys.' Professor Macoun (Senate Report, 1888) says that the aspen never grows large and seldom runs above a foot in diameter in the Peace river country although he had seen specimens larger than that. He would not speak of the aspen as a tree of economical value for the purposes of export.

ST. JOHN AND DUNVEGAN.

Between St. John, B.C., and Dunvegan, Professor Macoun reports many miles of beautiful farming country, alternating with spruce, aspen and cypress woods.

DUNVEGAN.

Of the country directly west of Dunvegan he writes that it was almost denuded of trees, probably by fires, and had much the appearance of prairie. After this the country assumed a park-like character, almost a dead level and more than half covered with trees. H. A. Conroy (Senate Com. Report, 1907), had been fourteen miles north on the Peace river from Dunvegan and found timber growing pretty large. He says there are groves in that country through which a man could drive a mowing machine, the trees are so far apart.

PEACE TO BATTLE RIVER.

H. J. Cambie (Dominion Government Pacific Railway Report, 1880), says that from Dunvegan they travelled northwest to the height of land between the Peace and Battle rivers; twenty-five per cent of the distance lay through woods of small poplar, spruce and black pine.

DUNVEGAN TO SMOKY RIVER.

Professor Macoun reports that Mr. Horetsky rode over the portage between Smoky river and Dunvegan, a distance of at least forty miles and he told him it was a beautiful prairie all the way. Professor Macoun says that as he proceeded up the river from the Smoky he could see that the left bank was a constant succession of grassy slopes with aspen copse and service berry thickets in the hollows. The right bank on the other hand was always wooded, the timber being aspen, white birch and spruce. The islands and points that formed the secondary bank were generally

8 EDWARD VII., A. 1908

covered with balsam poplar of a large size, but spruce, aspen and birch were in considerable quantities. H. J. Cambie (Dominion Government Pacific Report, 1880), says that the timber on the north bank is too small to be of value except for firewood and fencing.

NORTH HEART RIVER.

Southeast of the Peace along the North Heart river the poplar and spruce is of small size only three to twelve inches in diameter.

SMOKY RIVER.

In 1874 E. W. Jarvis made an exploration through a pass of the Rocky mountains and southeast to the Athabaska across the headwaters of the Smoky river and the numerous streams and rivers flowing into it, (Dominion Government Pacific Railway Report, 1874-75). Near the mountains he found the country recently burnt. The balance of the country they found to be composed in places of small black spruce, growing so close together that they could scarcely force a passage through them and in others covered with small pine of second growth. H. A. Conroy says that along the banks of the Little Smoky the spruce grows very large. From Smoky river to Sturgeon lake Mr. Cambie reports the timber of small size consisting of poplar, spruce, birch, willows and black pine in a few cases 9 to 12 inches in diameter. East of the Little Smoky river in the Prairie river country, Mr. Conroy says there are nice bluffs of timber, mixed, some spruce and some poplar, and along the Big Smoky he reports some very good spruce timber.

DUNVEGAN TO BATTLE RIVER.

Wm. Ogilvie (Senate Report, 1888) reports that the timber from Dunvegan to Battle river is thin and poor and in very few places he says could there be found much that would prove of any value. Here, as on the Athabaska, the timber on the upper part is not to be compared with that found on the lower. Mr. McConnell in (Pacific Railway report, 1880) says that here and there along White Mud river are clumps of aspen and willow, the balance being prairie.

BATTLE RIVER TO VERMILION.

North of this the timber improves. Mr. Ogilvie describes the country from Battle river to Vermilion as woods and swamp alternating with patches of prairie and open woods. Near Battle river he says many of the hill sides are bare or scrubby, but on some of the flats or moderate slopes the timber is of fair size. R. G. McConnell (Pacific Railway report, 1880) says that there is scarcely any prairie along Battle river.

From the reports of Professor Macoun (Senate Report, 1888) and Elihu Stewart (Senate Report, 1907) we see that there is some good timber along this part of the river probably north of Battle river. Professor Macoun says that north of Smoky river, on the right bank of the Peace, the country soon loses its prairie character and becomes wholly an aspen forest, which continues down to the delta of the Athabaska and Peace rivers. On the Peace river, especially on its islands, there are many large groves of spruce and poplar which attain extraordinary dimensions.

EXCELLENT POPLAR.

Mr. Stewart, twenty years later, speaks very highly of the poplar he saw in this part of the river, though whether poplar, however fine a quality, would ever be very valuable for commercial purposes, as he seems to think, is a matter of question. He says that below the junction of the Smoky they grow very clean and straight trees,

APPENDIX No. 2

not over a foot or fourteen inches, making excellent timber, as well as fencing and fuel. In some parts there are stretches of good spruce well adapted for lumbering purposes. There has so far been but little destruction from fire in this quarter, and there will be an ample supply of timber for local use, if not for export to the adjoining prairie regions. He followed the reading of the preceding extract from his report with the remark: 'I never saw as fine poplar as I saw there. A considerable number of poplars were over a foot, but a foot would be a fair average. I have seen poplar in all parts of the prairie country, but never saw any growing up as straight.' Mr. Stewart, replying to a question, said he thought it possible to use the poplar wood for commercial purposes. It is very good poplar. It will make pulp and where it is large enough it can be sawed. It makes excellent flooring. The white poplar in the north is of a better quality than the poplar in the Ottawa district and in the far west it is different. As to the extent of the forests, Mr. Stewart remarked that wherever there was a stream there would be a belt of timber.

W. F. Bredin explained that in the valley of the Peace river, the bottoms of the river, the islands—and there are large islands in the river—and the points are largely covered with a heavy growth of spruce which grows to a large size. The largest he had ever measured was four feet four inches in diameter. A tree of that kind would carry its trunk well up, clean of branches, forty or fifty feet. Of course that is an unusual size, but timber three feet in diameter is common on the hills and in the lower parts of the bottoms. There is no oak, but there is spruce, birch and poplar. The poplars grow to a large size. The cottonwood often grows to four feet in diameter and the poplar grows to a diameter of two feet.

LOON AND WABISKAW RIVERS.

East of this part of the Peace river lies the valley of the Loon and Wabiskaw rivers. R. G. McConnell travelled all through this country in 1887. He found travelling by canoe very precarious. It is a succession of swamps brulés, and spruce and poplar woods, sometimes dense. In places he found tamarack and banksian pine, but little or no timber of any value.

VERMILION.

At Vermilion, both north and south, Mr. Ogilvie described the country in 1888 as prairie bluff country. Professor Macoun (Pac. Ry. Rep. 1877-78) says that from the highest point reached near Vermilion as far as he could see the country was covered with a continuous aspen forest with here and there a group of spruce. Back from the river much of the country had been burnt over and the timber was either all gone or in various stages of decay.

LITTLE RED RIVER.

Below Vermilion between Little Red river and Rapid Bouille, he described the river as very wide, islands in every stage of development or decay being the chief characteristics of the river bed. All the islands were covered with immense balsam poplar while the aspen constituted the greater part of the general forest on the mainland.

VERMILION TO PEACE POINT.

Mr. Ogilvie says the country from Vermilion to Peace Point on the north side is generally heavily timbered, with occasional parts of open scrubby woods and small patches of prairie. On the south side the open woods and prairie are less frequent.

8 EDWARD VII., A. 1908

VERMILION RIVER TO LAKE ATHABASKA.

From Vermilion river to Lake Athabaska he says there is a great deal of first class spruce, much of it being the best he had seen in the country. The sandy and gravelly ridges here, as elsewhere, were covered with pitch-pine. There is also much poplar and cottonwood, generally small, mixed with a little white birch and a very little tamarack.

QUATRE FOURCHES RIVER.

On the Quatre Fourches river in the delta of the Peace, Professor Macoun (1888) says there is some very fine spruce, with groves of poplar and a few pitch-pine mixed through it.

LAKE ATHABASKA.

Of the good quality of the timber found at the delta of the Athabasca river we have already spoken.

SOUTH OF THE LAKE.

J. B. Tyrrell in 1893 described the country south of Lake Athabaska as covered with a light growth of small banksian pine. There were a few spruce and birch in the valleys of small streams and on a narrow strip along the lake. In 1892 Mr. Tyrrell travelled from the Churchill north to the country east of the lake.

EAST OF THE LAKE.

Approaching Wapata lake from the south he found the timber to improve. Wapata island in Wapata lake he found thickly wooded with spruce, birch, white poplar and a little larch, and near Black lake white spruce was seen for the first time since he had left the Churchill. Black river he also found fairly well wooded.

FORT CHIPEWYAN.

Around Fort Chipewyan on the north of the lake Professor Macoun reports the timber as generally small and nearly all spruce and pitch-pine; a small percentage of it only being fit for use as lumber. J. B. Tyrrell in 1893, said that back of the Fort between the rocky hills plenty of small timber for house building and firewood is found.

NORTH OF THE LAKE.

Along the north shore of the lake he says the chief varieties of timber observed as they passed along were spruce, white poplar and birch and with these, though of small size, the country was well covered.

BLACK LAKE AND NORTH.

The country for some way north of Black lake to Chipman lake is heavily timbered. It is a succession of dense spruce swamps, thickets and rocky hills. The timber is composed of small black spruce, banksian pine, larch and a few balsam poplars. The shores of Wolverine or Chipman lake are 'heavily and beautifully wooded with spruce and birch timber.'

APPENDIX No. 2

Beyond this the timber is poor. The Chipman river is scantily wooded with small banksian pine, spruce and birch. On Birch lake is a grove of large white spruce. At Selwyn lake the country is more or less generally wooded with small black spruce, but on some of the sandy tracts are orchard-like groves of birch.

SLAVE LAKE.

BELOW LAKE ATHABASKA.

At a distance of some twenty miles from Chipewyan says Mr. Stewart the land becomes higher and is covered with timber and considerable quantities of good spruce are seen up to 15 inches in diameter and of good height. The other varieties are poplar, birch, tamarack, and willow.

R. G. McConnell (Geol. Rep. 1887-88) says that the country in the vicinity of the rapids, 100 miles below Lake Athabaska, is covered with white spruce, banksian pine, and the rough and smooth-barked poplars. The MacKenzie river steamer was built here in the winter of 1887. The timber used in its construction was all obtained from the surrounding forest.

SMITH LANDING TO FORT SMITH.

From Smith Landing to Fort Smith Mr. Stewart says the timber is jackpine, some of which is quite large enough for railway ties. The timber on the heavier soil consists of black and white poplar, spruce, birch and willow of small size and of little value.

SALT RIVER.

Salt river, says Mr. McConnell, winds through flat wooded plains covered with spruce and aspen, but in parts are the salt plains.

SALT RIVER TO GREAT SLAVE LAKE.

Of the excellence of the forests from Salt river down there can be no doubt. As long ago as 1772 Samuel Hearne, the first white man to reach Great Slave lake, on his return journey from the mouth of the Coppermine, entered the mouth of the Slave river and went up it some distance before starting inland on his journey back to the Hudson bay. It is very interesting to note what Hearne at that distant date said: 'The woods around this river, particularly the pines and poplars, are the tallest and stoutest that I have seen in any part of North America. The birch also grows to a considerable size and some species of the willow are likewise tall; but none of them have any trunk like those in England.' On the island of the lake near the mouth of the river, Hearne saw great quantities of driftwood. He says, 'some of this wood is large enough to make masts for the largest ships that are built. The woods through which we were to pass were in many places so thick that it was necessary to cut a path before the women could pass with their sledges; and in other places so much of the woods had formerly been set on fire and burnt that we were frequently obliged to walk farther than we otherwise should have done, before we could find green brush enough to floor our tents.'

One hundred and fifteen years later R. G. McConnell (Geol. Rep., 1887-88) says that on both sides of the river are level plains which extend without any evident elevation, as far as the eye can reach, and support extensive forests of white spruce and banksian pine, mingled with larch and smooth and rough barked poplar. The spruce frequently attains a diameter of 18 inches and affords excellent timber.

Bishop Clut, O.M.I., (Senate Report, 1888) also says that from Fort Smith to Fort Resolution there is a great quantity of beautiful forest, white spruce or ordinary larch. Spruce from two or three feet in diameter is found. The birch of the country is very

8 EDWARD VII., A. 1908

hard and would make good furniture. It is from birch that they make traineaux, buggies, chairs and snowshoes.'

GREAT SLAVE LAKE.

HAY RIVER.

Hay river flows into the southwest part of Great Slave lake. Of the country around, Mr. McConnell (Geol. Rep., 1887-88), says, 'Grassy and partly wooded plains extend northwards from Peace river and skirt its southern shores. It is the northern limit of the prairie region. Near its mouth the country on both sides is thickly forested with banksian pine and white spruce to the Alexandra Falls.'

SOUTH OF THE LAKE.

The country from here east to the Slave river is known to be well wooded, but strange as it may seem, the country from Slave river east has never been explored since Samuel Hearne passed through it in 1772, one hundred and thirty-six years ago. Somewhere southeast of the lake Hearne spoke of a long narrow lake 'entirely surrounded with high land which produces a vast quantity of fir trees, but none of them grow to a great height in those parts. Their branches, however, spread wider than those of firs three times their height and thickness do in Europe, so that they resemble an apple tree in shape. They seem rich in tar as the wood of them will burn like a candle and emit as strong a smell and as much black smoke as the staves of an old tar barrel. The under woods were so thick in these parts as to render travelling through them very difficult.' Of the part of Great Slave lake where Hearne crossed it, he says, 'The point where we crossed it, is said to be the narrowest. It is full of islands most of which are clothed with fine, tall poplars, birch and pines, &c.'

NORTH OF THE LAKE.

The country to the north of Great Slave lake has been much more thoroughly examined.

PROVIDENCE TO FORT RAE.

R. G. McConnell (Geol. Rep., 1887-88) wintered at Fort Providence on the Mackenzie and made a winter journey northeast to Fort Rae, on the long arm of the lake that reaches out to the north. From Fort Providence to Birch lake, half the distance across, he crossed the Grand Brulé, the scene of a former destructive fire, wherein he says there were three wide prairies with the intervening timber belts. From here on he crossed first a well wooded country where some excellent spruce was seen, then a more scantily clad country with groves of spruce, poplar, birch and alder and from thence to Fort Rae a thick spruce forest.

MARTIN RIVER.

J. M. Bell (Geol. Rep., 1904) describes the country along the Martin river and chain of lakes emptying into the long northern arm of the lake as thickly wooded with aspen, balsam poplar, canoe-birch, white spruce and banksian pine.

YELLOWKNIFE RIVER.

The Yellowknife river flows into the eastern side of the long arm of the lake coming from a northern direction. Sir John Franklin and members of his party ascended and descended this river, as is related in his journeys of 1819-22. He says that this river flows between high rocky banks on which there is sufficient soil to

APPENDIX No. 2

support pines, birch and poplars, but in the upper stretches the country has a very barren aspect. From here to Fort Enterprise the country is much the same. Mr. Back (afterwards Sir George Back), one of his party on his winter journey back from Fort Enterprise, wrote that after passing Reindeer lake 'The scenery consisted of barren rocks and high hills, covered with lofty pine, birch and larch trees. There was a visible increase of wood, consisting of birch and larch, as we inclined to the southward.

FORT ENTERPRISE.

In his journal of August 19, 1820, Sir John Franklin states that they selected the site of their winter quarters known as Fort Enterprise. He says: 'The trees were numerous and of a far greater size than we had supposed them to be yesterday. Some of the pines being thirty or forty feet high and two feet in diameter at the root.' Near by was the winter river, whose banks, he says, were well clothed with pines. On the same day they unfortunately set fire to the woods. 'A fire was made on the south side of the river to inform the chief of our arrival, which, spreading before a strong wind, caught the whole wood and we were completely enveloped in a cloud of smoke for the three following days.' Their winter quarters were made from wood cut in the vicinity, though of the size of the logs no mention is made. From here to the Coppermine river the only trees were scattered dwarf pines.

Of the part of the lake where Samuel Hearne crossed it we have already spoken of his mention of the islands clothed with fine tall poplars.

EAST OF THE LAKE.

The eastern part of the lake approaches within twenty miles of the 'Barren Lands,' as the pines are said by Back to disappear along Artillery lake.

FORT RELIANCE.

The following is on account of the country around old Fort Reliance and north-east to the barren lands, as described by J. W. Tyrrell in 1901:—

'Fairchild Point (near old Fort Reliance), which is about ten miles in length, is well wooded with white spruce from 6 to 12 inches in diameter and is notable as being the source of timber in that locality.

The shores of Charlton harbour are sparingly wooded with small spruce and a few banksian pines. It might be noted here that on Fairchild point a few black poplars were observed, the last seen on our outward journey.

At Fort Reliance, here and there, are to be seen the charred remains of large stumps, indicating the apparent recent destruction of the original forest.

The largest young trees, which showed thirty-four to thirty-five years growth, were from 4 to 6 inches in diameter two feet from the ground, and were not of stunted appearance.

At the north end of Burr lake there is situated a nice grove of white spruce timber, containing trees of 10 to 12 inches diameter. It proved to be the last timber of any consequence met with before entering the barren lands, excepting some on the west shore of Artillery lake near Timber bay.

ARTILLERY LAKE.

On the western side of Artillery lake, about ten miles from the south end, the shore is quite well timbered with small spruce and they continue northerly, although thinly scattered, for a distance of twenty miles, eight miles farther north than the last grove on the east shore. There the woods cease entirely.'

8 EDWARD VII., A. 1908

MACKENZIE RIVER.

ENTRANCE TO MACKENZIE RIVER.

Elihu Stewart says that the land at the entrance to the Mackenzie river is low and covered with spruce and tamarack of small size. Islands covered with green timber are numerous and the appearance is suggestive of the lower St. Lawrence. The timber along the Mackenzie to Fort Simpson is smaller than that found along the Slave river but nevertheless it is of sufficient size in some cases for lumber.

FORT PROVIDENCE.

Sir John Franklin (Journey, 1819-22) says that around Fort Providence the surface of the hills is generally naked, but in the valleys between them a few spruce, aspen and birch grow.

Sir Alexander MacKenzie (1789) also speaks of the country north of the Mackenzie after leaving Slave lake as follows: 'He (an Indian) at the same time informed us that a river falls in from the north, which takes its rise in the Horn mountain, now in sight, which is the country of the Beaver Indians; and that he and his relations frequently meet on that river. He also added, that there were very extensive plains on both sides of it, which abound in buffaloes and moose deer.'

BEAVER RIVER.

R. G. McConnell (Geol. Survey Rep. 1887-88) says that from Fort Providence southwest along Beaver river to Lake Bis-tcho is a desolate looking plain scantily covered with spruce and tamarack. Lake Bis-tcho is surrounded by a flat country, wooded with spruce, birch and tamarack of fair size.

FORT SIMPSON.

James Anderson of Winnipeg left Fort Simpson in 1852 when eleven years old (Senate Report 1888). He says 'Round Fort Simpson itself, I remember the timber there was very large. It was fir, poplar and birch.' He calls the fir hemlock but no doubt means the spruce. Poplar and birch he says were the other varieties. He says that the fir was a very large kind. The men used to square the timber to about one foot square, for building their houses and the Fort itself was built of squared timber. He says the way he remembers the birch was, it was used to much in the making of snow-shoes and other things.

Mr. Stewart (1906) says there is a small sized saw-mill at Fort Simpson, not now running, in which lumber 12 inches in width was cut and used in buildings at this post. 'One cannot but be struck,' he says, 'with the vast quantity of spruce along the route traversed, (from Fort Providence to Fort Simpson) which is a little under size for lumber but would make excellent pulpwood.'

Before describing the timber of the Mackenzie Basin from the Great Slave river down, we will describe the valley of the Liard river.

LIARD RIVER.

The Liard river enters the Mackenzie river at Fort Simpson, just south of latitude 62°, coming in from the south-west. It and the Slave river have undoubtedly the best timber in the northwest.

NELSON, RIVER.

A branch of the Liard extends away south and is called the Nelson. Wm. Ogilvie explored this whole region across to the Peace, coming out at Fort St. John. Across the height of land the timber is very poor.

APPENDIX No. 2

On the Nelson above the forks where the Sicannie chief branch flows in, it is heavily timbered. Mr. Ogilvie passed many extensive flats covered with beautiful spruce trees. The valley is quite wide and clothed with fine timber for a distance above the forks of about thirty miles.

Farther down above Fort Nelson there are many extensive areas of open woods which almost might be classed as prairie, no doubt the result of forest fires.

FORT NELSON.

Of Fort Nelson he says it is surrounded by dense, high forest, and as the clearing around it is only a few acres in extent, much of the sun's warmth is lost during the day. The surface is all heavily wooded and there are many very large trees both spruce and balsam poplar. He selected an average sized balsam poplar at Fort Nelson, cut it down and made the following measurements of it:—diameter at stump, exclusive of bark, 29 inches; at first limb, exclusive of bark, 17½ inches; stump to first limb 90 feet; number of growing rings 145. The bark would add at least 4 inches to the diameter.

WRIGLEY.

The country about Wrigley he says is wooded. He noticed a spruce log near the post that was 20 inches in diameter.

Entering the valley of the Liard from the Mackenzie he says there is a good deal of fine large spruce, which would make better lumber than most of the spruce used in the settled part of the territories, but, as it is the Arctic water system it is practically out of reach. The balsam poplar, or as it is called here, cottonwood, is very plentiful and very large, trees nearly 4 feet in diameter being often seen, though between 2 or 3 feet is the average diameter of the trees. These two trees constitute the great mass of the forest. A few small white birches are occasionally seen and more frequently the aspen or poplar. There are also, sometimes, a few balsam pines on the top of sandy knolls.

A man who had explored the Liard told Mr. Stewart that he had never seen finer saw-log timber anywhere. He also said that good birch was found there which is highly prized by the Indians for bark for their canoes.

R. G. McConnell (Geol. Survey Rep., 1888-89), says that below Fort Liard the river is bordered in many places with wide alluvial flats, covered with tall straight cottonwood, and large spruce and canoe birch.

MACKENZIE BASIN.

MACKENZIE BASIN.

We have now come almost to the Arctic regions. Although, except in small quantities, the forests of the lower Mackenzie are not of great value commercially it is interesting to follow up what the explorers and others testify as to the remarkable height and diameter some of the trees attain, considering the extreme northern latitude in which they are found. On the Mackenzie itself the forest continues to within a comparatively short distance from the Arctic Ocean. The following extracts are from Sir John Richardson's travels in 1848:—

FOREST FIRES IN THE FAR NORTH.

'The agency of man is working a change in the aspect of the forest even in the thinly peopled north. The woods are wasted by extensive fires, kindled accidentally or intentionally, which spread with rapidity over a wide extent of country, and continue to burn until they are extinguished by heavy rains. These conflagrations

8 EDWARD VII., A. 1908

consume even the soil of the drier tracts, and the bare and whitened rocks testify for centuries to the havoc that has been made. A new growth of timber, however, sooner or later springs up; and the soil, when not wholly consumed, being saturated with alkali, gives birth to a thicket of aspen instead of the aboriginal spruce.

REMARKABLE SIZE OF THE FOREST.

The frozen sub-soil of the northern portions of the woodland country does not prevent the timber from attaining a good size, for the roots of the white spruce spread over the icy substratum as they would over smooth rock. As may be expected, however, the growth of trees is slow in the high latitudes. On the borders of Great Bear lake, 400 years are required to bring the stem of the white spruce to the thickness of a man's waist. When the tree is exposed to high winds, the fibres of the wood are spirally twisted; but in sheltered places, or in the midst of the forest, the grain is straight and the wood splits freely.

As has been already said, the general aspect of the forest does not alter in the descent of the Mackenzie. The white spruce continues to be the chief tree. In this quarter (speaking generally), it attains a girth of 4 or 5 feet, and a height of about 60 in a growth of from two to three hundred years, as shown by the annual layers of wood. One tree, cut down in a sheltered valley near Clark's Hill, south of Great Bear river, measured the unusual length of one hundred and twenty-two feet, but was comparatively slender. Most of the timber is twisted, particularly where the trees grow in exposed situations. The banksian pine was not traced to the north of Great Bear Lake river; but the black spruce, in a stunted form, is found on the borders of swamps as far as the woods extend.

GENERAL REMARKS.

MACKENZIE BASIN.

Mr. Stewart explained that spruce suitable for commercial purposes grows to the Arctic sea. He was astonished to find that the limit of tree growth extended as far north as it does. He thought it extended probably ten degrees, or nearly seven hundred miles farther north in this district than in Labrador. The different kinds of trees that we have in the Mackenzie basin include white spruce, black spruce, the larch or tamarack which is found as far north as the spruce, the jackpine and the balsam. Mr. Stewart did not see any balsam in the Arctic circle; but aspen, white poplar, balm of Gilead and birch are all found down as far as Fort Macpherson near the delta of the Mackenzie.

Mr. McConnell (Senate Report, 1888), says that you get jackpine in places as far north as Fort Good Hope. Although not growing very large some of the trees would be big enough for railway ties. He explained that the country is not forest continually like it is here (Ontario), but most of the country is open wood. Nearly all the muskegs and around the muskegs are covered with black spruce. Mr. McConnell agrees with other travellers of this region in saying that very little change in the character of the forest was observed in descending the Mackenzie, and with the exception of the banksian pine, which disappears south of Bear river, the same species as previously noticed by Richardson, are found from Great Slave lake to the mouth of Peel river.

HARDNESS OF THE WOOD IN THE NORTH.

Malcolm McLeod (Senate Report, 1888) says: 'As to the wood of that far north I would observe that it is remarkably hard. I have a pair of snow shoes of peculiar

APPENDIX No. 2

shape, made right and left of birch for frame, like iron in texture, and though perhaps about a hundred years old perfectly sound.'

FORT GOOD HOPE.

Mr. Stewart says that on an island near Fort Good Hope very good spruce timber is cut into lumber by whip-saws.

BELOW FORT GOOD HOPE.

Below this the timber seems to get poorer, although it improves again farther north. Mr. Stewart says that below Fort Good Hope the timber is smaller although some of it has been made into flooring and lumber is made from the timber there. There is a large supply of spruce suitable for pulp.

NORTHEAST OF FORT GOOD HOPE.

Northeast of Fort Good Hope, through a chain of lakes to the headwaters of the Iroquois river, R. MacFarlane (Canadian Record of Science, vol. IV.) says that the country appeared to be well timbered in every direction with pines, juniper, several species of willow, and a few small groves of poplar and birch.

OLD FORT GOOD HOPE.

Mr. McConnell (Geol. Rep., 1887-88) says that along this part of the Mackenzie below Fort Good Hope the banks are low, the bordering plains are covered with a scattered growth of willow, spruce and tamarack, with here and there patches of aspen on the drier ridges. The spruce along part of this reach presents a remarkably stunted and dwarfish appearance, but this is due more to the marshy character of the ground than to climatic severity, as the same tree, straight and well grown, was found much farther north. At old Fort Good Hope, where the river takes a sharp turn to the west-southwest, he says groves of white spruce were seen along this reach, containing trees measuring over 15 inches in diameter, but the average did not exceed 6 inches.

POINT SEPARATION.

At Point Separation, which lies between the junction of the Mackenzie and Peel rivers, and where Franklin and Richardson were camped, are two spruce trees, says Mr. Stewart, which were marked as lobstersticks at the time of their separation and in commemoration of that event. 'Both are still standing (1906), though one of them is dead. Judging from their appearance at a distance I would say that they are about 16 inches in diameter and 70 feet in height, and this nearly one hundred miles beyond the Arctic Circle. I have been very much interested in the tenacity of life shown in the growth of trees under the adverse conditions prevailing in this north country. Since crossing the Arctic Circle we have seen no vegetation but trees such as the spruce, birch, tamarack and willow are seen all the way.'

PEEL RIVER.

As they rounded Point Separation and ascended Peel river he says spruce lined the banks.

FORT MACPHERSON.

It attains a size of 12 to 16 inches and is used at Fort Macpherson not only for their log buildings, but it is also whip-sawed into lumber for general use, and the birch bark here is used by the Indians for their canoes. For a distance of a few miles

8 EDWARD VII., A. 1908

from the Peel the country is partially wooded with spruce, birch, balsam-poplar and willow, but after this the only timber is that found skirting the shores of the small streams on the way.

BELL RIVER.

A fringe of timber, mostly small spruce, lines the banks of the Bell, but apparently does not extend far back.

DELTA OF THE MACKENZIE.

Returning north again to the delta of the Mackenzie, Mr. McConnell (Senate Report, 1888) describes the spruce he saw as over two feet through. Sir John Richardson descended the delta to the ocean in 1848 and the following is his account of the timber:—

SIR JOHN RICHARDSON, 1848.

THE DELTA.

‘Most of the islands constituting the delta of the Mackenzie are alluvial and many of the smaller ones are merely a ring of white spruce trees and willows on a sand or mud bank. Twenty-two miles below Point Separation the banks of the river and the numerous islands are well wooded. The balsam poplars rise to the height of 20 feet and the white spruce to 40 or 50 feet.

At the creek, which bounds Harrison island on the north, the valleys and borders of the river are well wooded, but the summits of the eminence present only scattered spruce firs, with stunted tips and widely spreading depressed lower branches. The canoe-birch is frequent, and the trees we measured were about 5 inches in diameter. The balsam poplar grows to the height of twenty feet. In latitude 68° 55' north the trees disappeared so suddenly that I could not but attribute their cessation to the influence of the sea-air. Beyond this line a few stunted spruces only were seen struggling for existence and some scrubby canoe-birches clinging to the bases of the hills.’

GREAT BEAR LAKE.

To the southeast of the region just described lies the Great Bear lake which empties into the Mackenzie river through the Great Bear river. The latter is described by J. M. Bell—Geological Survey Report 1904:—

GREAT BEAR RIVER.

‘The clear waters of the Great Bear river join the Mackenzie through a deep wooded valley. For the first forty miles the banks are well wooded with white spruce, canoe birch, aspen and balsam poplar.

MOUNT CHARLES.

Mount Charles rises to a height of 1,500 feet on the left side of the river. In climbing the hill I was surprised at the size of the trees around its lower slope. White spruce of about 20 inches diameter were quite common as well as fine specimens of canoe-birch, balsam poplar and aspen.

At the lake the country is quite destitute of trees, as they have all been used for fuel by the Indians.’

APPENDIX No. 2

AGE OF TREES

As was formerly stated, Sir John Richardson says that around Great Bear lake 400 years are required to bring the stem of the white spruce to the thickness of a man's waist, and in some places where the tree is exposed to the high winds the fibres of the wood are spirally twisted.

KEITH BAY.

Between Keith bay and Smith bay J. M. Bell found a small lake well wooded with white spruce, willows and alders but none of them of great size. Here he saw the most northern specimen of white birch. The surrounding country was wooded in the valleys.

NORTHERN SHORE.

The whole northern shore of the lake he found to be particularly dreary and barren.

LIMESTONE POINT.

It was, he says, a pleasing change from the cheerless, gravelly, treeless shores, to reach Limestone Point thirty miles west of Fort Confidence, with its pronounced shoreline and white spruce in the bay.

FORT CONFIDENCE.

In a letter of Thomas Simpson to his father (says Malcolm McLeod, Senate Report 1888), he says that the wood at Fort Confidence had been found suitable for house and boat building. Dr. Bell says that the location of Fort Confidence was one of the few well wooded spots in Great Bear lake and the trees are fine specimens worthy of a more southern latitude.

DEASE RIVER.

Sir John Richardson in 1826 says that there were pine trees in clumps in the Dease river and the valley to the north was well wooded.

EAST SHORE.

West of Fort Confidence along the coast of Dease bay for some distance the deep bays are well wooded, but towards Cape McDonnell the land gets barren and continues so till the coast turns east again when the trees improve.

TAKAATCHO RIVER.

'Some forty-five miles east of Cape McDonnell,' says Dr. Bell, 'a good sized river enters, probably the Takaatcho. Near its mouth,' he says, 'we found great quantities of driftwood among which were some good sized trunks. I was rather surprised to see these, but learned afterwards that in the interior the valley of this river is well wooded.'

MACTAVISH BAY.

'All the eastern shore of MacTavish bay is wooded. In the valleys in the interior and around the bays and sheltered channels this timber may be of economic importance. White spruce is the prevailing forest tree, although canoe-birch is found as far north as Eda Travers bay and is sufficiently large in Klarondesk bay to permit of its bark being used for making canoes. Tamarack and both balsam poplar and aspen abound in Klarondesk bay, although not of any great size.'

8 EDWARD VII., A. 1908

CAMSELL RIVER

South of this, the eastern part of the lake, Dr. Bell describes the Camsell river and chain of lakes as all well wooded. At Lake Ray, banksian pine was noticed for the first time.

RIVERS OF ARCTIC BASIN.

There remains only to be described the rivers running into the Arctic Ocean. The first river of importance met with east of the Mackenzie is the Anderson river.

ANDERSON RIVER.

Mr. R. MacFarlane, chief factor Hudson's Bay company, was sent in 1857, by James Anderson to explore the Anderson river. The report of his trip was published in the 'Canadian Record of Science,' vol. iv.

CANOE LAKE.

At Canoe lake, the headwaters of the Iroquois river, he says the country is tolerably wooded in its vicinity. The banks of the Iroquois seem to be all wooded as he found the navigation impeded by immense quantities of driftwood and he says the ridges on both sides were well covered with pine and willow.

LOCKHART RIVER.

The country along the Lockhart river below the Iroquois he found better timbered.

On the banks of the Anderson below the Lockhart he found timber of medium size gradually disappearing as he went north.

ANDERSON RIVER.

On his return trip he proceeded up the Anderson from the Lockhart and found the banks well wooded. Further on near a succession of rapids he found the banks tolerably wooded. He says, 'The country along the Anderson was latterly very well wooded, and some goodly pines were seen. The tract of country embraced by a line drawn west from the borders of the woods on the Anderson to the Mackenzie, southward to the Peau de Lievre river (Hare Indian river), at Good Hope, is very well timbered.

ROSS RIVER.

The banks of Ross river he says are partially timbered.

A chain of well wooded hills he says encircle Colville lake or more probably the large lake west of the lake marked Colville. The banks of Simpson lake he says are well timbered.

From here southwest towards the Hare Indian river he found the country well wooded. He says 'the timber consists of pine, juniper, fir, willow, and a few groves of poplar and birch. Some of the pines were of a large size. The belt of timber which at Fort Anderson extends for over thirty miles to the eastward, rapidly narrows and becomes a mere fringe along the Anderson river and disappears to the northward of the 69th parallel of latitude.

APPENDIX No. 2

MACFARLANE RIVER.

Running parallel with the Anderson river is the MacFarlane or Wilmot Horton river. Mr. MacFarlane says that one or two intersecting affluents of the Wilmot Horton or MacFarlane river flow through valleys in which a few stunted spruce, birch and willows appear at intervals. On the banks of one of these, near its mouth, he observed a sheltered grove of spruce and willows of larger growth. They met with no more spruce to the eastward.

COPPERMINE RIVER.

Sir John Franklin (first journey, 1819-22), reached the upper part of the Coppermine river at Point lake. He found the 'valleys on its borders interspersed with clusters of spruce trees. On the borders of such of these lakes as communicate with the Coppermine river, there are a few groves of spruce trees, generally growing on accumulations of sand.'

RED ROCK LAKE.

Red Rock lake is in general narrow, its shelving banks are well clothed with wood, and even the hills, which attain an elevation of four hundred or five hundred feet, are ornamented half way up with stunted pines.

ROCK-NEST LAKE.

Rock-Nest lake (just north of the Red Rock lake). 'The only wood is the pine, which is twenty or thirty feet high, and about one foot in diameter.'

FAIRY LAKE.

At Fairy lake the river flows between banks of sand thinly wooded, and as we advanced the barren hills approached the water's edge.

West of that part of the Coppermine river which is nearest to Great Bear lake Sir John Richardson in 1826 said that they met with wooded valleys and saw much wood in the valleys far to the west. From the height of land between Coppermine river and Great Bear lake they had an extensive view of a lower and well wooded country.

KENDALL RIVER.

In 1848 he writes of the same locality: 'At two we came to another branch of the Kendall, which runs through a ravine of red and spotted sandstone, under whose shelter there grew a remarkably fine grove of white spruces. The best grown tree measured 63 inches in circumference and did not taper perceptibly for twenty feet from its root. Its total height was from 40 to 50 feet. Other trees of equal girth tapered more, and one decayed trunk, which lay on the ground, looked to be considerably thicker.'

BLOODY FALLS.

Of the country above Bloody falls, on the Coppermine, he writes: 'In the existence of many scattered stumps of decayed spruce fir trees, and the total absence of young plants, one might be led to infer that of late years the climate has deteriorated and that the country was no longer capable of supporting trees so near the sea coast as it had formerly done. The largest tree in the clump in which we bivouacked had a circumference of 37 inches at the height of 4 feet from the ground. Its annual layers were very numerous and fine and indicated centuries of growth, but I was unable to reckon them.'

8 EDWARD VII., A. 1908

Samuel Hearne, the first white man to reach the Coppermine, says in the year 1771: 'Near the water's edge there is some wood, but not one tree grows on or near the top of the hills between which the river runs. There appears to have been formerly much greater quantity than there is at present; but the trees seem to have been set on fire some years ago and, in consequence, there are at present ten sticks lying on the ground for one green one which is growing beside them. The whole timber appears to have been even in its greatest prosperity of so crooked and dwarfed a growth as to render it of little use for any purpose but firewood.'

In another place he writes: 'The woods grow gradually thinner and smaller as you approach the sea, and the last little tuft of pines that I saw is about thirty miles from the mouth of the river, so that we meet with nothing between that spot and the seaside but barren hills and marshes.'

This ends the report as far as the wooded areas of the north are concerned. Even in the barren lands, however, isolated wooded areas are found, one of the most remarkable instances of which is the Ark-i-link river described in David T. Hanbury's book and which river is now called after Mr. Hanbury. The following is the account:—

HANBURY RIVER.

'The peculiarity of the Ark-i-link is that though so far north it is wooded on either bank, and in places one might say heavily timbered, spruce trees, with butts measuring $1\frac{1}{2}$ to 2 feet across, being by no means uncommon. It is a long way north of the limit of trees marked on the maps, and there is a large extent of country to the south of it destitute of trees.'

After a short walk on either side of the river one reaches the outer edge of the bush.

Having read over the preceding transcript of my evidence, I certify it correct.

R. E. YOUNG,
Superintendent of Railway Lands.